

# BGO807; BGO807/FC0; BGO807/SC0

870 MHz optical receivers

Rev. 01 — 7 July 2004

Product data sheet

## 1. Product profile

### 1.1 General description

High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fiber 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 mono mode optical input suitable for 1290 nm to 1600 nm wavelengths, a terminal to monitor the photo diode current and an electrical output having a characteristic impedance of 75  $\Omega$ .

#### 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.

### 1.2 Features

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

### 1.3 Applications

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

# PHILIPS

### 1.4 Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency range		40	-	870	MHz
S <sub>22</sub>	output return losses	f = 40 MHz to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB
d <sub>2</sub>	second order distortion	f = 854.5 MHz	-	-	-55	dB
F	equivalent noise input	f = 40 MHz to 870 MHz	-	-	8.5	pA/ $\sqrt{\text{Hz}}$
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	175	-	205	mA

## 2. Pinning information

Table 2: 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

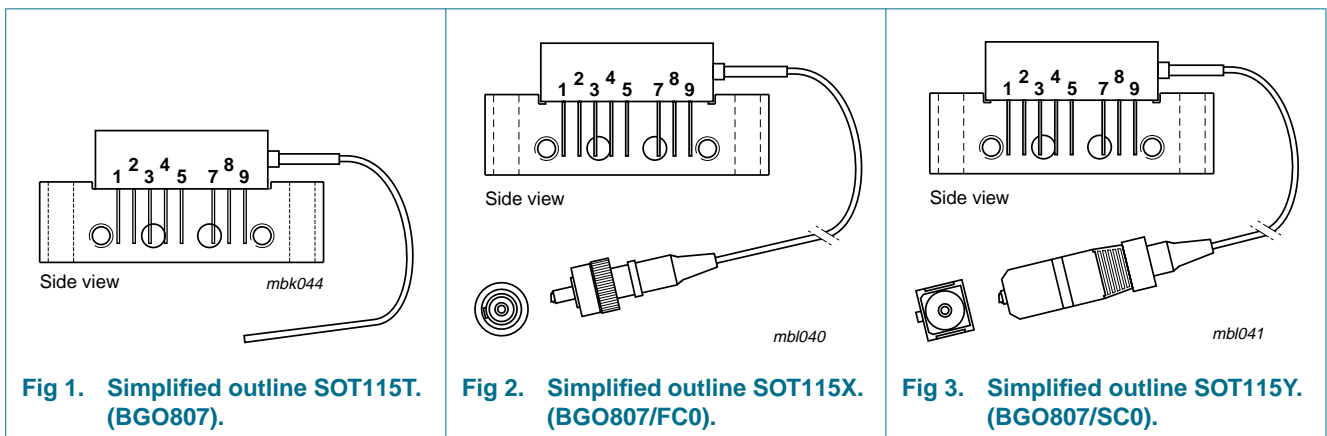


Fig 1. Simplified outline SOT115T. (BGO807).

Fig 2. Simplified outline SOT115X. (BGO807/FC0).

Fig 3. Simplified outline SOT115Y. (BGO807/SC0).

### 3. Ordering information

**Table 3: Ordering information**

Type number	Package		Version
	Name	Description	
BGO807	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; optical input; 8 gold-plated in-line leads	SOT115T
BGO807/FC0	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; optical input with connector; 8 gold-plated in-line leads	SOT115X
BGO807/SC0	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; optical input with connector; 8 gold-plated in-line leads	SOT115Y

### 4. Limiting values

**Table 4: 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

### 5. Characteristics

**Table 5: Characteristics**

In accordance with the Absolute Maximum Rating System (IEC 60134); bandwidth 40 MHz to 870 MHz; V<sub>B</sub> = 24 V; T<sub>mb</sub> = 30 °C; Z<sub>L</sub> = 75 Ω.

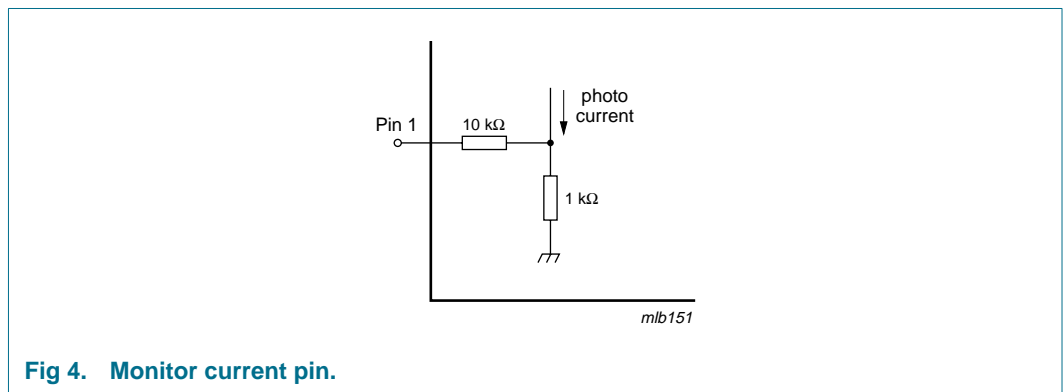
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
S	responsivity						
	BGO807	λ = 1300 nm	800	-	-	V/W	
	BGO807/FC0; BGO807/SC0	λ = 1300 nm	750	-	-	V/W	
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	1	dB	
SL	slope straight line	f = 40 MHz to 870 MHz	0	-	2	dB	
S <sub>22</sub>	output return losses	f = 40 MHz 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	[1] [2]	-	-	-66	dB
		f <sub>m</sub> = 746.5 MHz	[1] [3]	-	-	-61	dB
		f <sub>m</sub> = 854.5 MHz	[1] [4]	-	-	-55	dB
d <sub>3</sub>	third order distortion	f <sub>m</sub> = 853.25 MHz	[5] [6]	-	-	-71	dB

**Table 5: Characteristics ...continued**

In accordance with the Absolute Maximum Rating System (IEC 60134); bandwidth 40 MHz to 870 MHz;  $V_B = 24\text{ V}$ ;  $T_{mb} = 30\text{ }^\circ\text{C}$ ;  $Z_L = 75\text{ }\Omega$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
F	equivalent noise input	$f = 40\text{ MHz to }450\text{ MHz}$	-	-	7	$\text{pA}/\sqrt{\text{Hz}}$
		$f = 450\text{ MHz to }750\text{ MHz}$	-	-	8	$\text{pA}/\sqrt{\text{Hz}}$
		$f = 750\text{ MHz to }870\text{ MHz}$	-	-	8.5	$\text{pA}/\sqrt{\text{Hz}}$
$S_\lambda$	spectral sensitivity	$\lambda = 1310 \pm 20\text{ nm}$	0.85	-	-	A/W
		$\lambda = 1550 \pm 20\text{ nm}$	0.9	-	-	A/W
$\lambda$	optical wavelength		1290	-	1600	nm
L	length of optical fiber; SM type; 9/125 $\mu\text{m}$	BGO807	1	-	-	m
		BGO807/FC0; BGO807/SC0	746	-	861	mm
$I_{\text{tot}}$	total current consumption (DC)		175	-	205	mA
$I_{\text{bias}}$	diode bias current at pin 4 (DC)		-	-	25	mA

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



**Fig 4. Monitor current pin.**

6. 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; 8 gold-plated in-line leads SOT115T

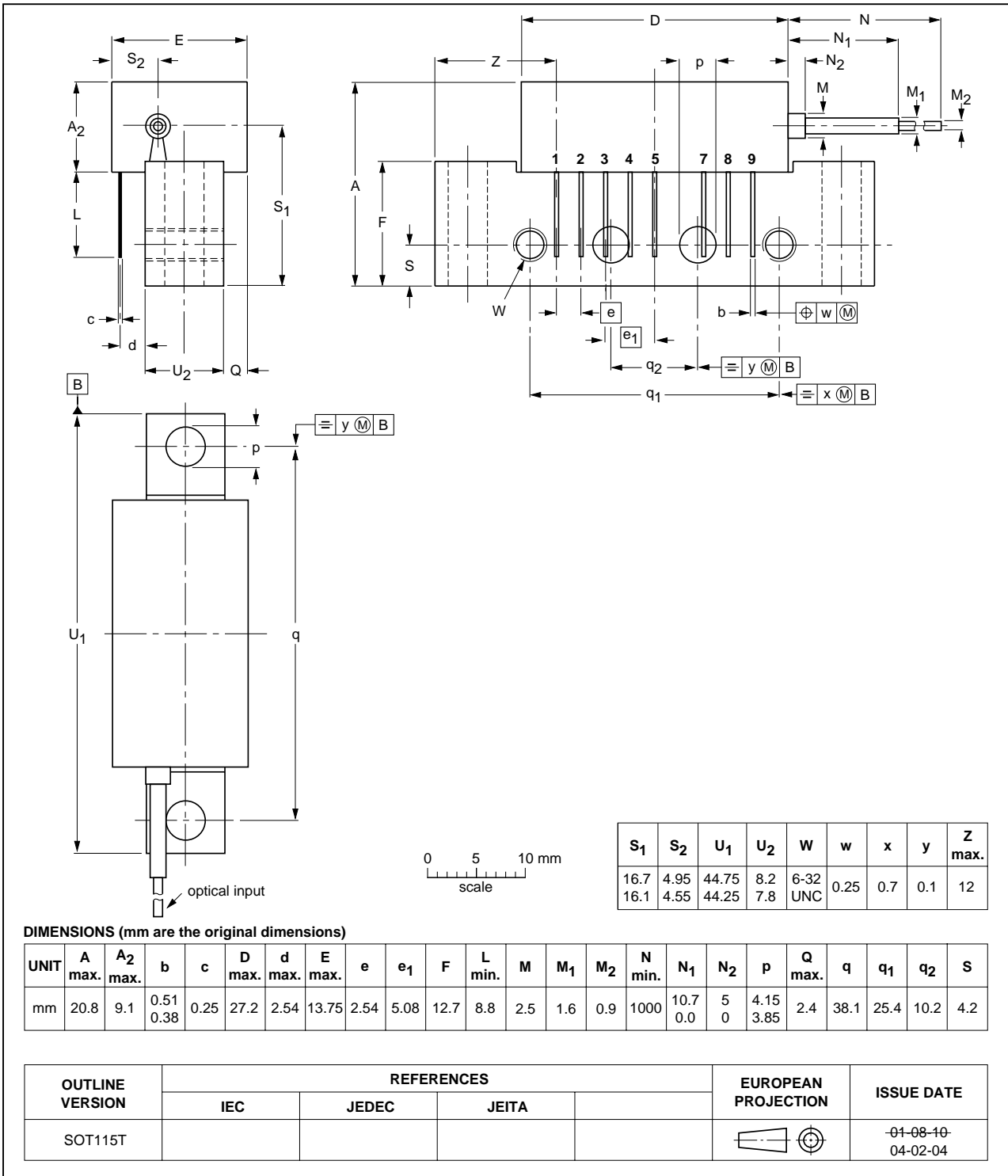


Fig 5. Package outline SOT115T.

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

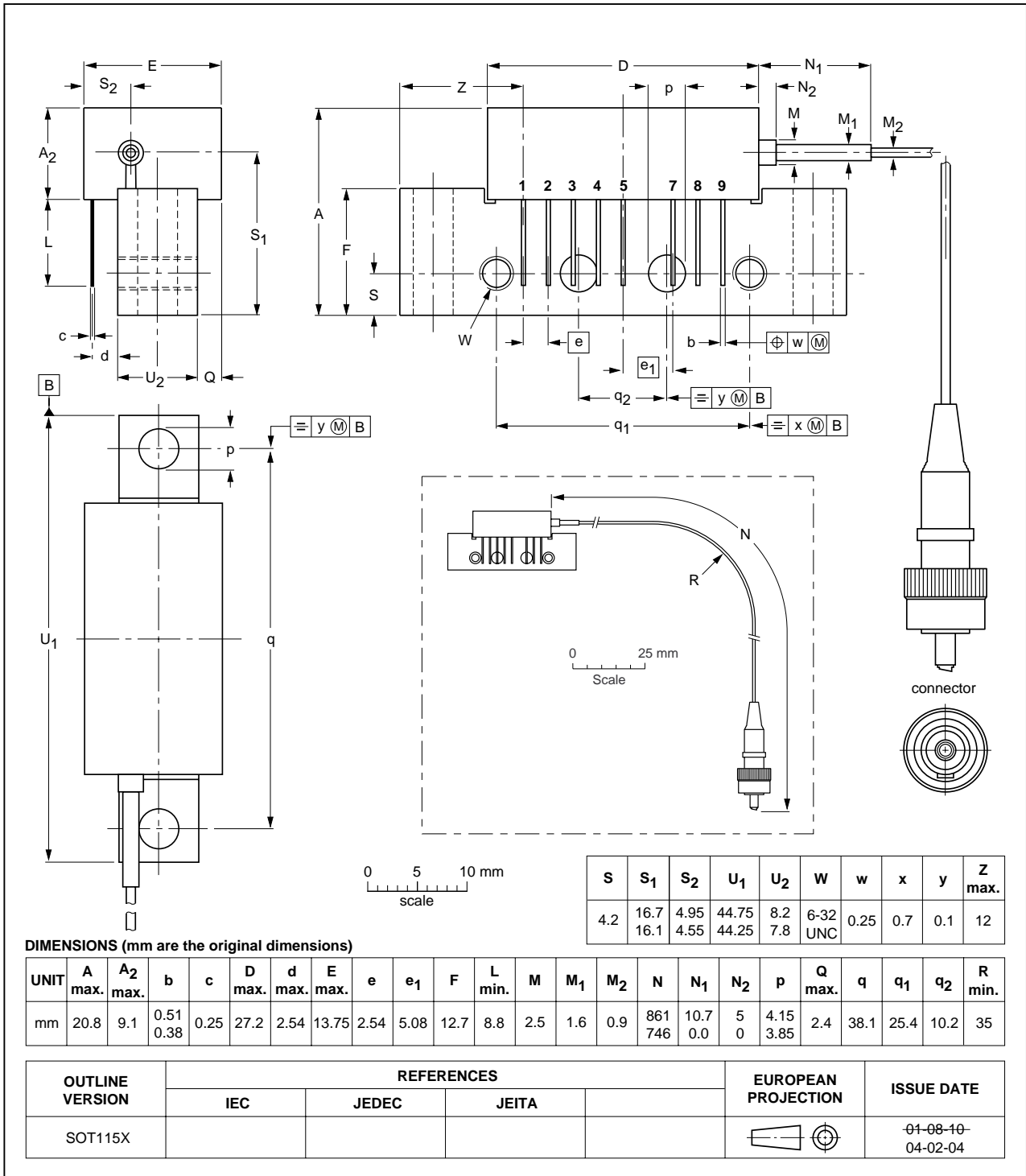


Fig 6. Package outline SOT115X.

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

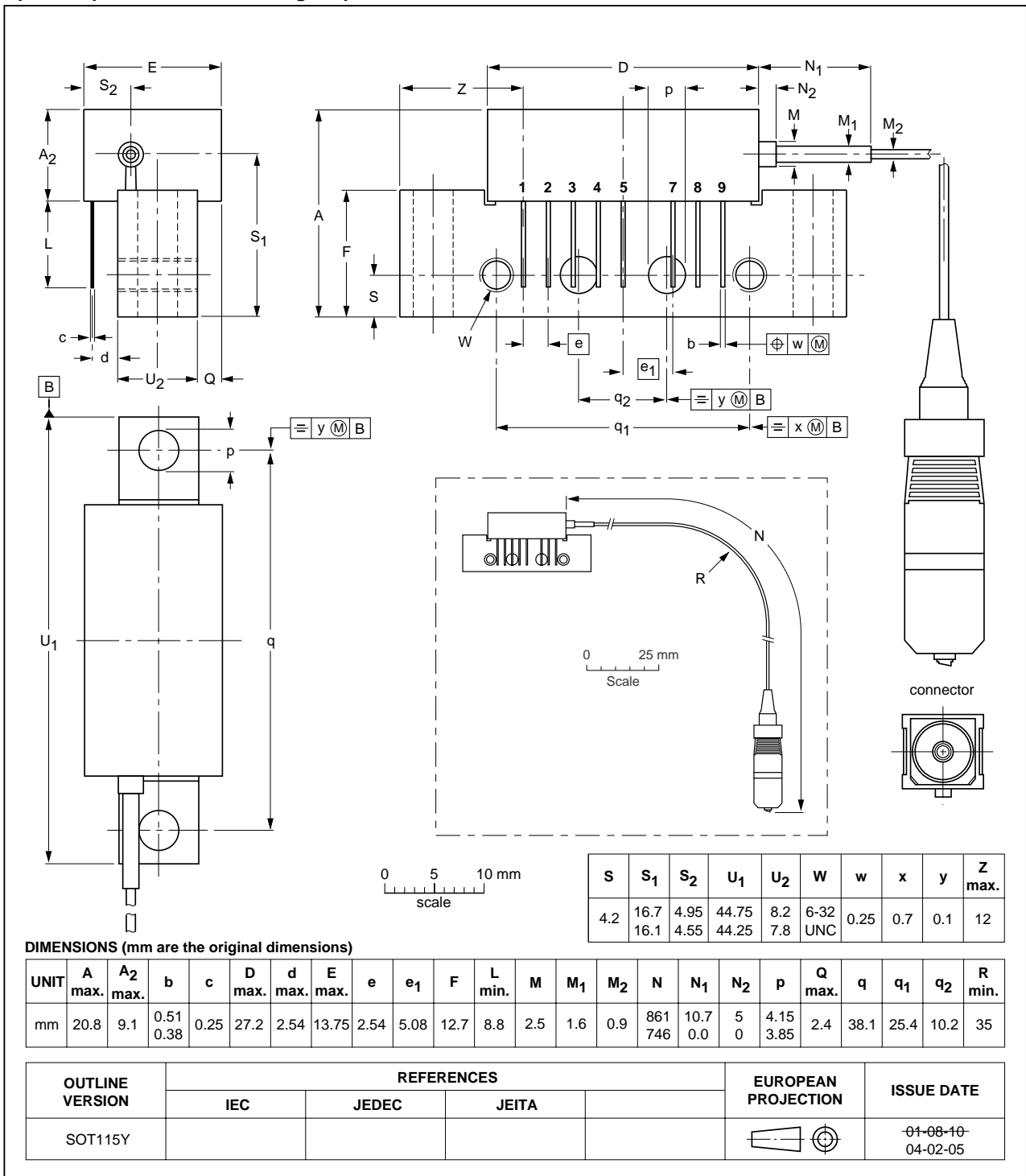


Fig 7. Package outline SOT115Y.

## 7. Handling information

---

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

## 8. Revision history

---

Table 6: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
BGO807_FC0_SC0_1	20040707	Product data sheet	-	9397 750 13192	-



## 9. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2]</sup> <sup>[3]</sup>	Definition
I	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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 10. Definitions

**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.

**Application information** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## 11. Disclaimers

**Life support** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

## 12. Contact information

For additional information, please visit: <http://www.semiconductors.philips.com>

For sales office addresses, send an email to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com)

## 13. Contents

---

<b>1</b>	<b>Product profile</b> .....	<b>1</b>
1.1	General description .....	1
1.2	Features .....	1
1.3	Applications .....	1
1.4	Quick reference data .....	2
<b>2</b>	<b>Pinning information</b> .....	<b>2</b>
<b>3</b>	<b>Ordering information</b> .....	<b>3</b>
<b>4</b>	<b>Limiting values</b> .....	<b>3</b>
<b>5</b>	<b>Characteristics</b> .....	<b>3</b>
<b>6</b>	<b>Package outline</b> .....	<b>5</b>
<b>7</b>	<b>Handling information</b> .....	<b>8</b>
<b>8</b>	<b>Revision history</b> .....	<b>8</b>
<b>9</b>	<b>Data sheet status</b> .....	<b>9</b>
<b>10</b>	<b>Definitions</b> .....	<b>9</b>
<b>11</b>	<b>Disclaimers</b> .....	<b>9</b>
<b>12</b>	<b>Contact information</b> .....	<b>9</b>



© Koninklijke Philips Electronics N.V. 2004

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: 7 July 2004  
Document order number: 9397 750 13192

Published in The Netherlands