

# 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

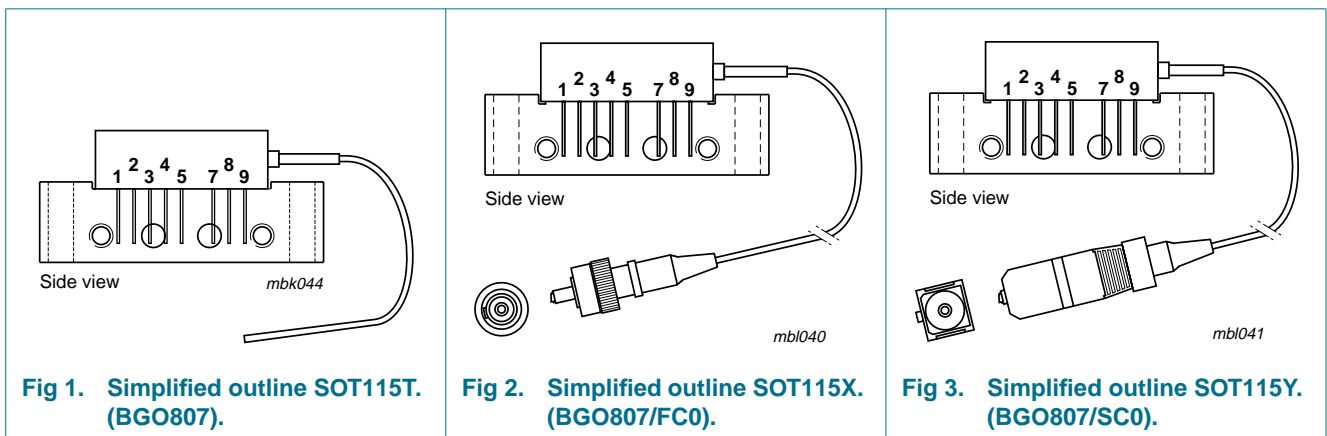
Table 1: Quick reference data

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/√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



### 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.

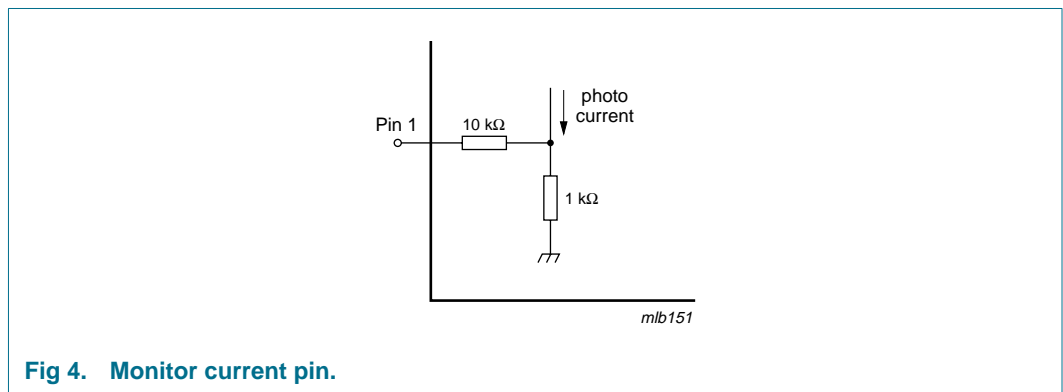
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
S	responsivity						
	BGO807	λ = 1300 nm	800	-	-	V/W	
	BGO807/FC0; BGO807/SC0	λ = 1300 nm	750	-	-	V/W	
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	1	dB	
SL	slope straight line	f = 40 MHz to 870 MHz	0	-	2	dB	
S <sub>22</sub>	output 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

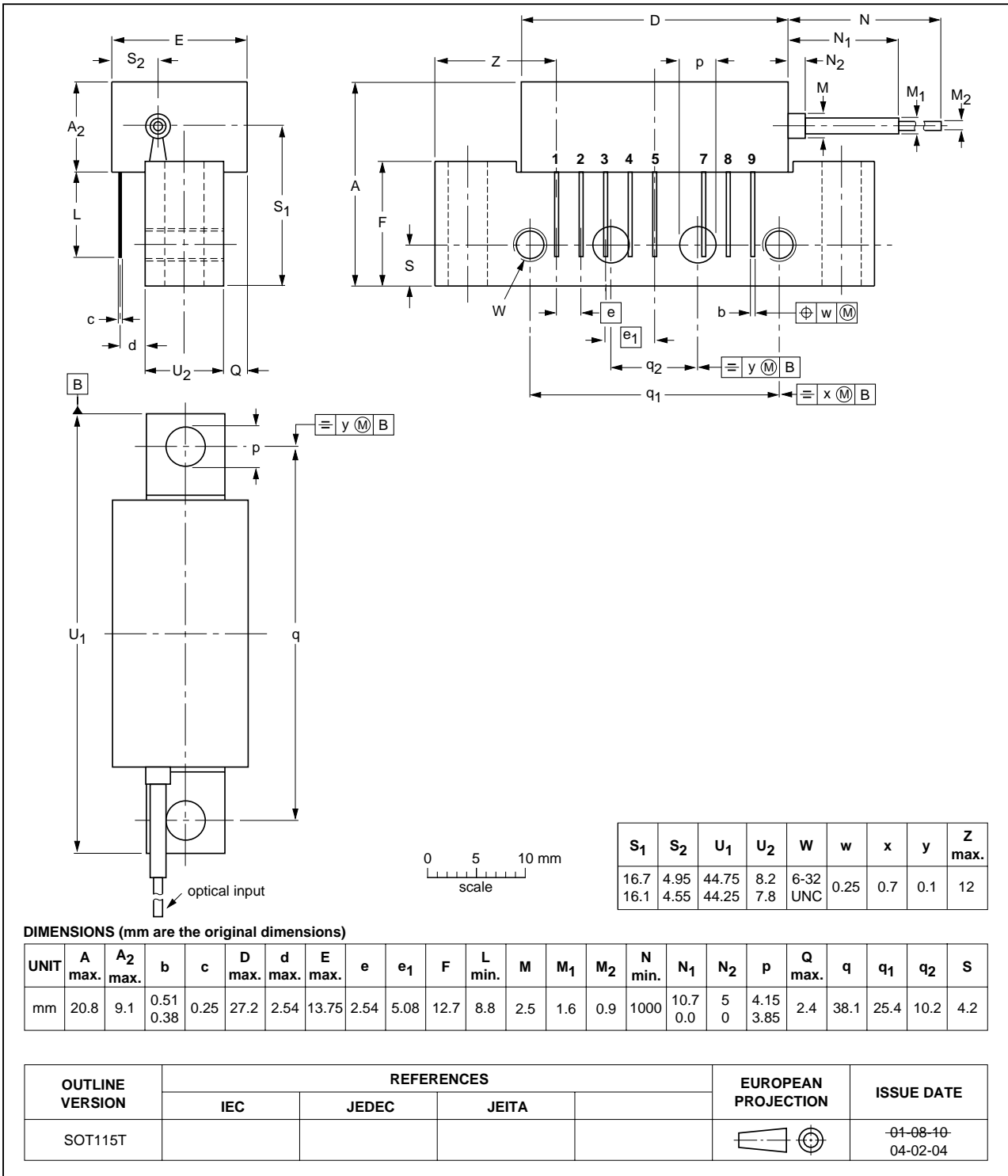


Fig 5. Package outline SOT115T.

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

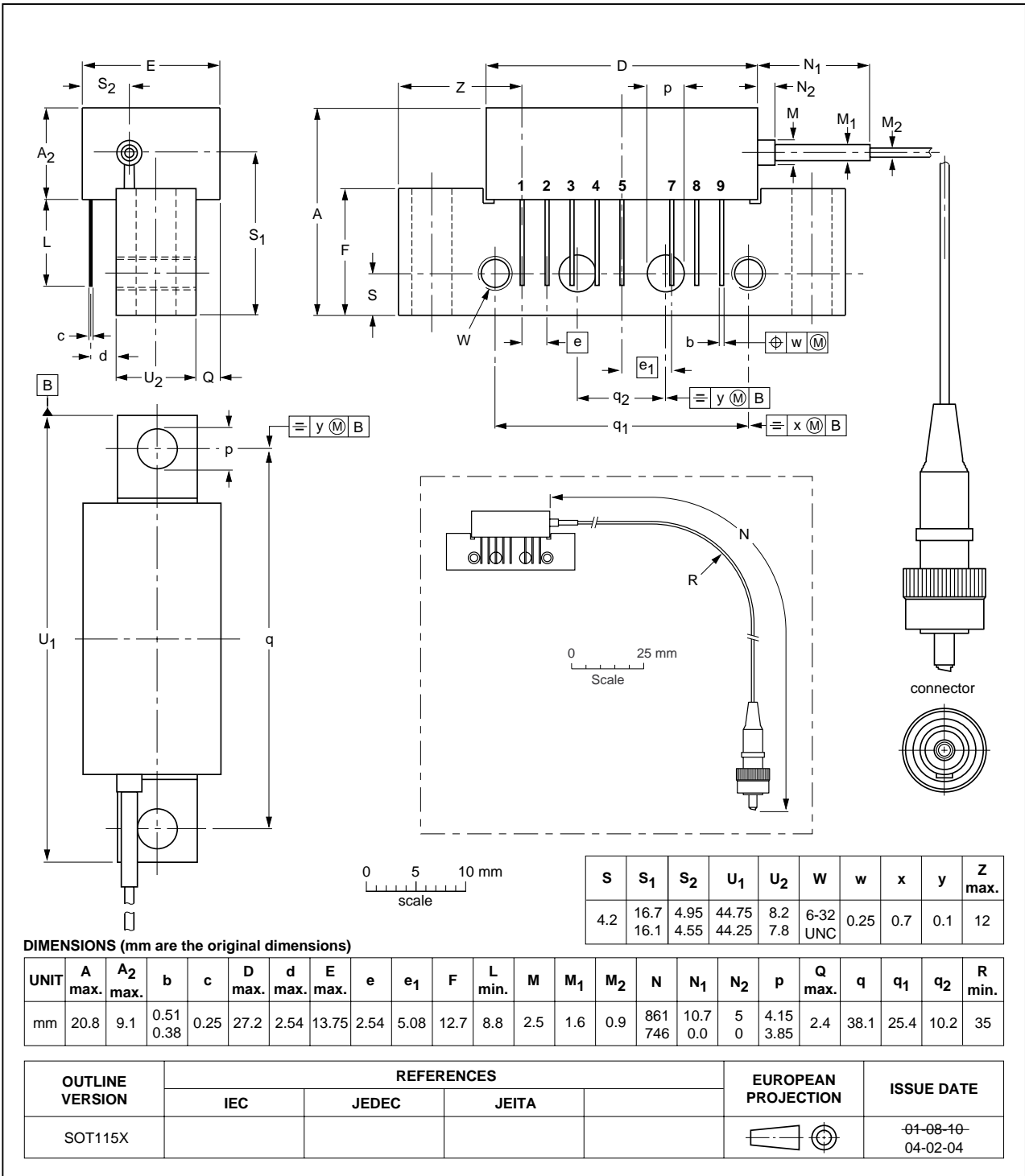


Fig 6. Package outline SOT115X.

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

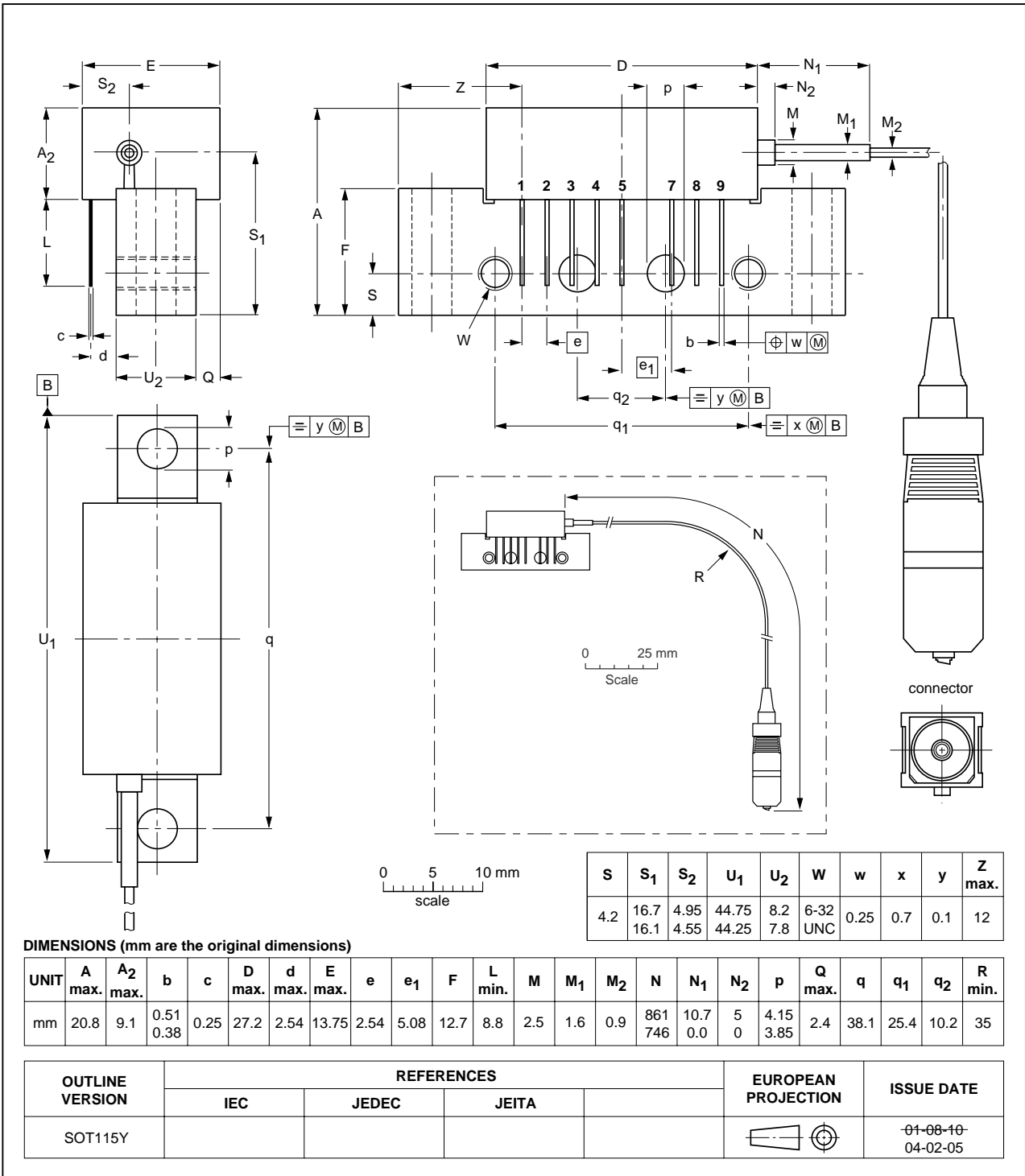


Fig 7. Package outline SOT115Y.

## 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.
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