

# BGO807; BGO807/FC0; BGO807/SC0

870 MHz optical receivers

Rev. 2 — 29 September 2010

Product data sheet

## 1. Product profile

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### 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 device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features and benefits

- 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.



**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	Simplified outline	Graphic symbol
<b>BGO807 (SOT115T)</b>			
1	monitor current		
2, 3	common		
4	+V <sub>B</sub> of the photodiode		
5	+V <sub>B</sub> of the amplifier		
7, 8	common		
9	output		
<b>BGO807/FC0 (SOT115X)</b>			
1	monitor current		
2, 3	common		
4	+V <sub>B</sub> of the photodiode		
5	+V <sub>B</sub> of the amplifier		
7, 8	common		
9	output		
<b>BGO807/SC0 (SOT115Y)</b>			
1	monitor current		
2, 3	common		
4	+V <sub>B</sub> of the photodiode		
5	+V <sub>B</sub> of the amplifier		
7, 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.

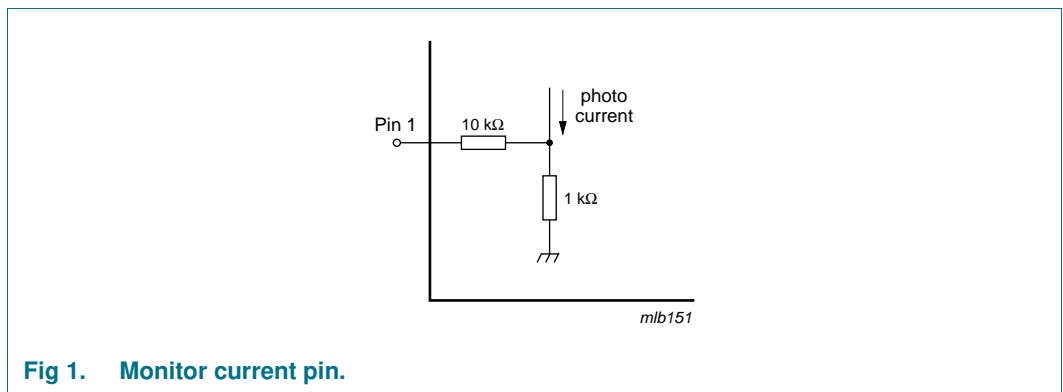
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
S	responsivity						
	BGO807	λ = 1300 nm	800	-	-	V/W	
	BGO807/FC0; BGO807/SC0	λ = 1300 nm	750	-	-	V/W	
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	1	dB	
SL	slope straight line	f = 40 MHz to 870 MHz	0	-	2	dB	
S <sub>22</sub>	output 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]  $f_m = 853.25\text{ MHz}$ ;  $f_p = 133.25\text{ MHz}$ ;  $f_q = 265.25\text{ MHz}$ ;  $f_r = 721.25\text{ MHz}$ .

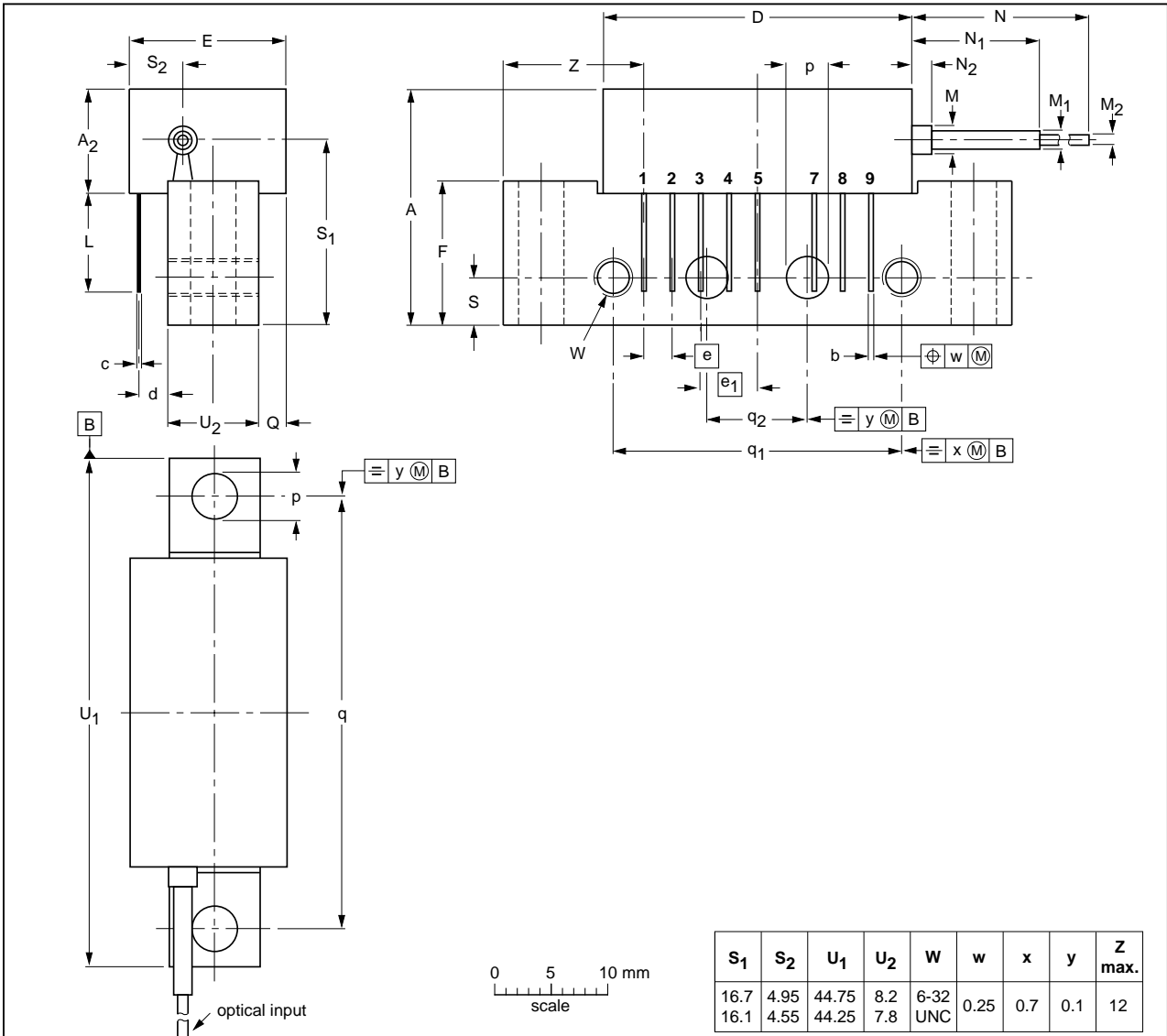


**Fig 1. Monitor current pin.**

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



S <sub>1</sub>	S <sub>2</sub>	U <sub>1</sub>	U <sub>2</sub>	W	w	x	y	Z <sub>max.</sub>
16.7	4.95	44.75	8.2	6-32	0.25	0.7	0.1	12
16.1	4.55	44.25	7.8	UNC				

DIMENSIONS (mm are the original dimensions)

UNIT	A <sub>max.</sub>	A <sub>2max.</sub>	b	c	D <sub>max.</sub>	d <sub>max.</sub>	E <sub>max.</sub>	e	e <sub>1</sub>	F	L <sub>min.</sub>	M	M <sub>1</sub>	M <sub>2</sub>	N <sub>min.</sub>	N <sub>1</sub>	N <sub>2</sub>	p	Q <sub>max.</sub>	q	q <sub>1</sub>	q <sub>2</sub>	S
mm	20.8	9.5	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 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	4.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115T						04-02-04 10-06-18

Fig 2. 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

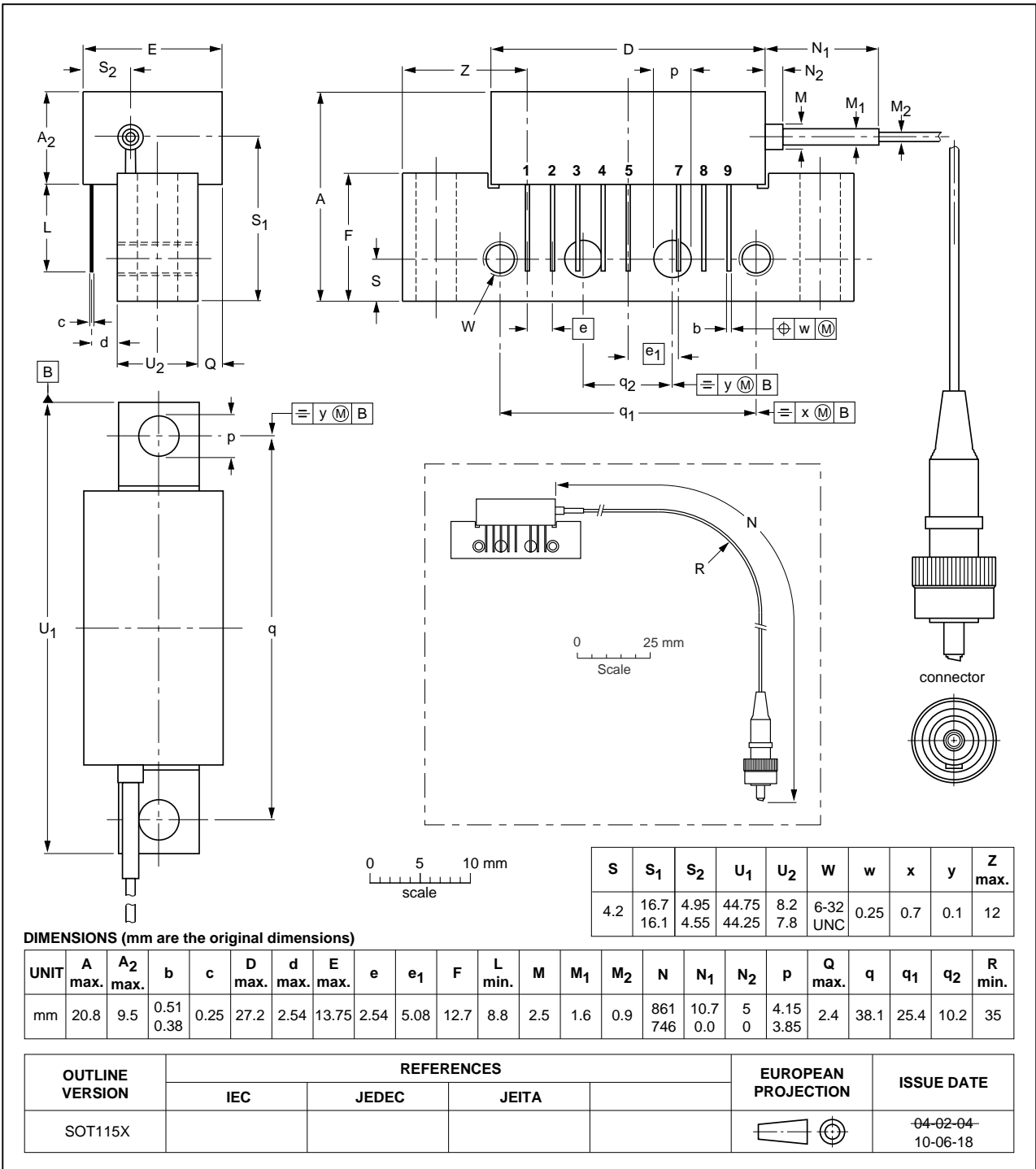


Fig 3. Package outline SOT115X.

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

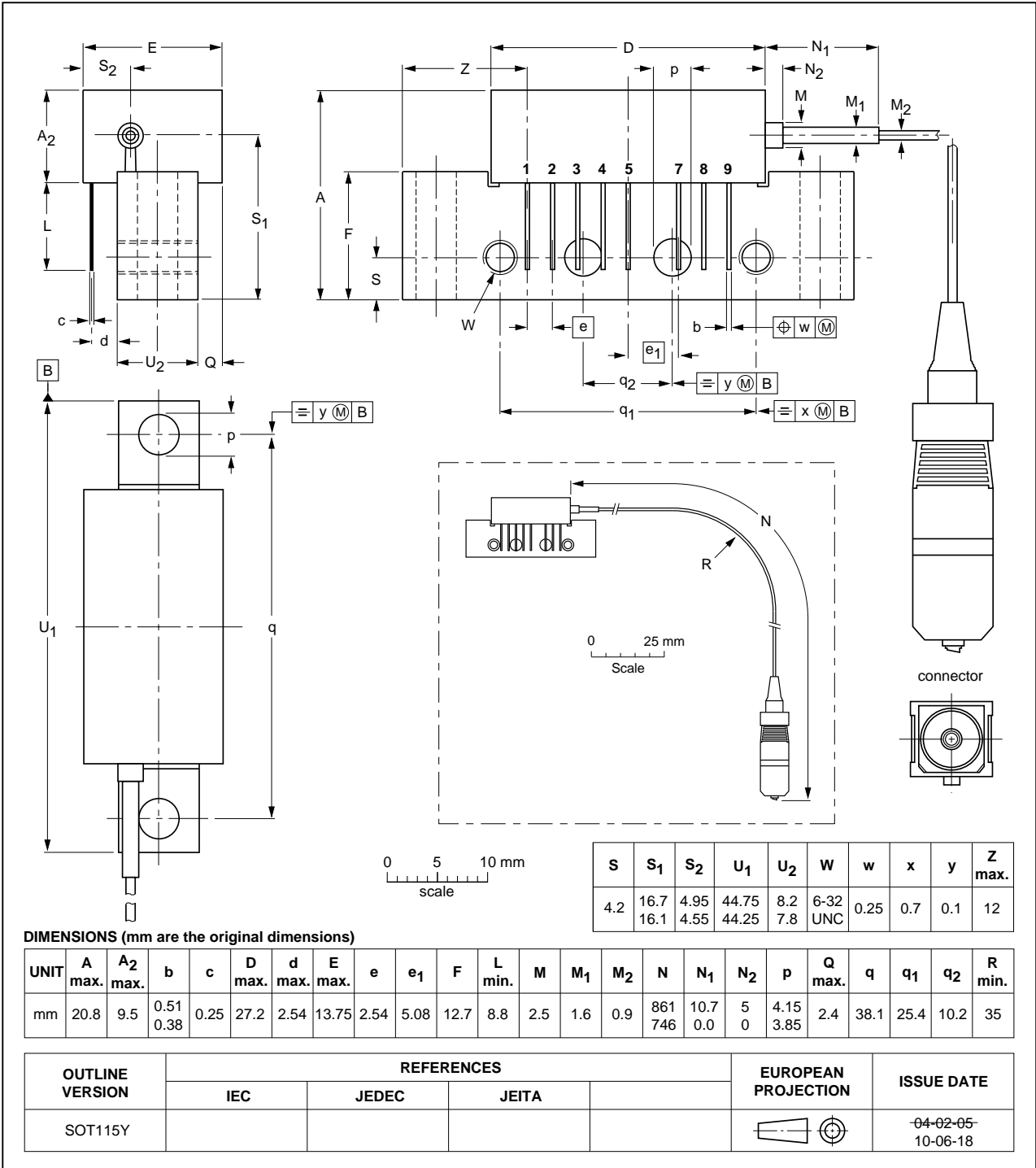


Fig 4. Package outline SOT115Y.

## 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	Supersedes
BGO807_FC0_SC0 v.2	20100929	Product data sheet	-	BGO807_FC0_SC0 v.1
Modifications:		<ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• Pinning information: presentation was modified, graphic symbols were added.</li><li>• Package outline and simplified outline drawings have been updated to the latest version.</li></ul>		
BGO807_FC0_SC0 v.1 (9397 750 13192)	20040707	Product data sheet	-	-



## 9. Legal information

### 9.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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[2] The term 'short data sheet' is explained in section "Definitions".

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