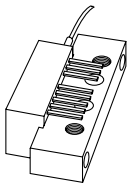


BGO827; BGO827/FC0; BGO827/SC0

870 MHz optical receivers

Rev. 04 — 29 March 2005 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 photodiode 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 photodiode current and an electrical output having a characteristic impedance of 75 Ω.

CAUTION

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

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

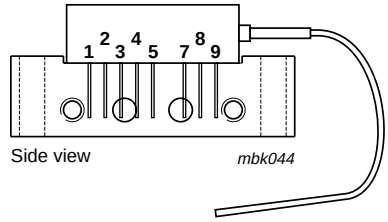
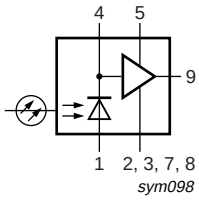
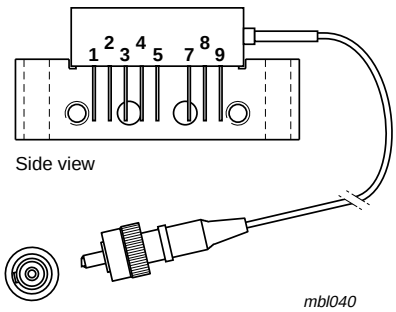
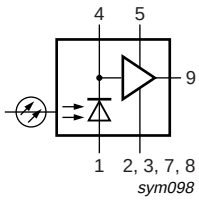
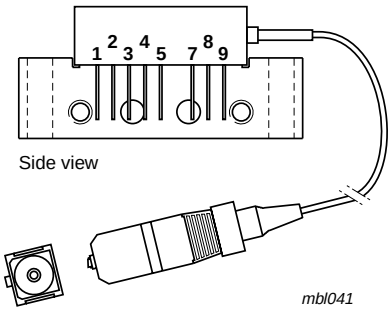
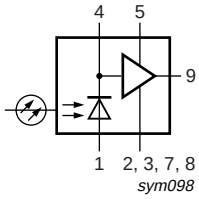
1.4 Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency range		40	-	870	MHz
s_{22}	output return losses	f = 40 MHz to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB
d_2	second order distortion	f = 854.5 MHz	-	-	–57	dB
F	equivalent noise input	f = 40 MHz to 870 MHz	-	-	8.5	pA/√Hz
I_{tot}	total current consumption (DC)	V_B = 24 V	175	-	205	mA

2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
BGO827 (SOT115T)			
1	monitor current		
2, 3	common		
4	$+V_B$ of the photodiode		
5	$+V_B$ of the amplifier		
7, 8	common		
9	output		
BGO827/FC0 (SOT115X)			
1	monitor current		
2, 3	common		
4	$+V_B$ of the photodiode		
5	$+V_B$ of the amplifier		
7, 8	common		
9	output		
BGO827/SC0 (SOT115Y)			
1	monitor current		
2, 3	common		
4	$+V_B$ of the photodiode		
5	$+V_B$ of the amplifier		
7, 8	common		
9	output		

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BGO827	-	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
BGO827/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
BGO827/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_{stg}	storage temperature		–40	+85	°C
T_{mb}	mounting base temperature		–20	+85	°C
P_{in}	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

Bandwidth 40 MHz to 870 MHz; V_B = 24 V; T_{mb} = 30 °C; Z_L = 75 Ω.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
S	responsivity					
	BGO827	λ = 1300 nm	800	-	-	V/W
	BGO827/FC0; BGO827/SC0		750	-	-	V/W
ΔS	responsivity difference	responsivity at T_{mb} = 85 °C – responsivity at T_{mb} = 30 °C; f = 870 MHz	-	–50	-	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
ΔSL	slope difference	slope at T_{mb} = 85 °C – slope at T_{mb} = 30 °C	-	–0.35	-	dB
s_{22}	output return losses	f = 40 MHz to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB

Table 5: Characteristics *...continued*

Bandwidth 40 MHz to 870 MHz; V_B = 24 V; T_{mb} = 30 °C; Z_L = 75 Ω.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
d_2	second order distortion	f_m = 446.5 MHz	[1] [2]	-	-	–68	dB
		f_m = 746.5 MHz	[1] [3]	-	-	–63	dB
		f_m = 854.5 MHz	[1] [4]	-	-	–57	dB
Δd_2	second order distortion difference	d_2 at T_{mb} = 85 °C – d_2 at T_{mb} = 30 °C		-	2.5	-	dB
		d_2 at T_{mb} = –20 °C – d_2 at T_{mb} = 30 °C		-	–1.5	-	dB
d_3	third order distortion	f_m = 853.25 MHz	[5] [6]	-	-	–73	dB
Δd_3	third order distortion difference	d_3 at T_{mb} = 85 °C – d_3 at T_{mb} = 30 °C		-	1	-	dB
		d_3 at T_{mb} = –20 °C – d_3 at T_{mb} = 30 °C		-	–1	-	dB
F	equivalent noise input	f = 40 MHz to 450 MHz		-	-	7	pA/√Hz
		f = 450 MHz to 750 MHz		-	-	8	pA/√Hz
		f = 750 MHz to 870 MHz		-	-	8.5	pA/√Hz
s_λ	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 fiber	SM type; 9/125 µm					
	BGO827			1	-	-	m
	BGO827/FC0; BGO827/SC0			746	-	861	mm
I_{tot}	total current consumption (DC)			175	-	205	mA
I_{bias}	diode bias current at pin 4 (DC)			-	-	25	mA

[1] Two laser test; each laser with a modulation index of 40 %; P_{opt} = 1 mW (total)

[2] f_m = 446.5 MHz; f_p = 97.25 MHz; f_q = 349.25 MHz

[3] f_m = 746.5 MHz; f_p = 133.25 MHz; f_q = 613.25 MHz

[4] f_m = 854.5 MHz; f_p = 133.25 MHz; f_q = 721.25 MHz

[5] Three laser test; each laser with a modulation index of 60 %; P_{opt} = 1 mW (total)

[6] f_m = 853.25 MHz; f_p = 133.25 MHz; f_q = 265.25 MHz; f_r = 721.25 MHz

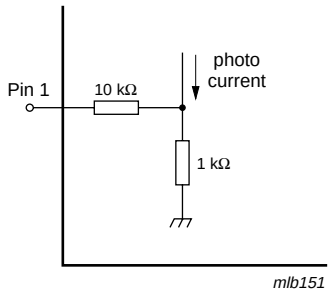
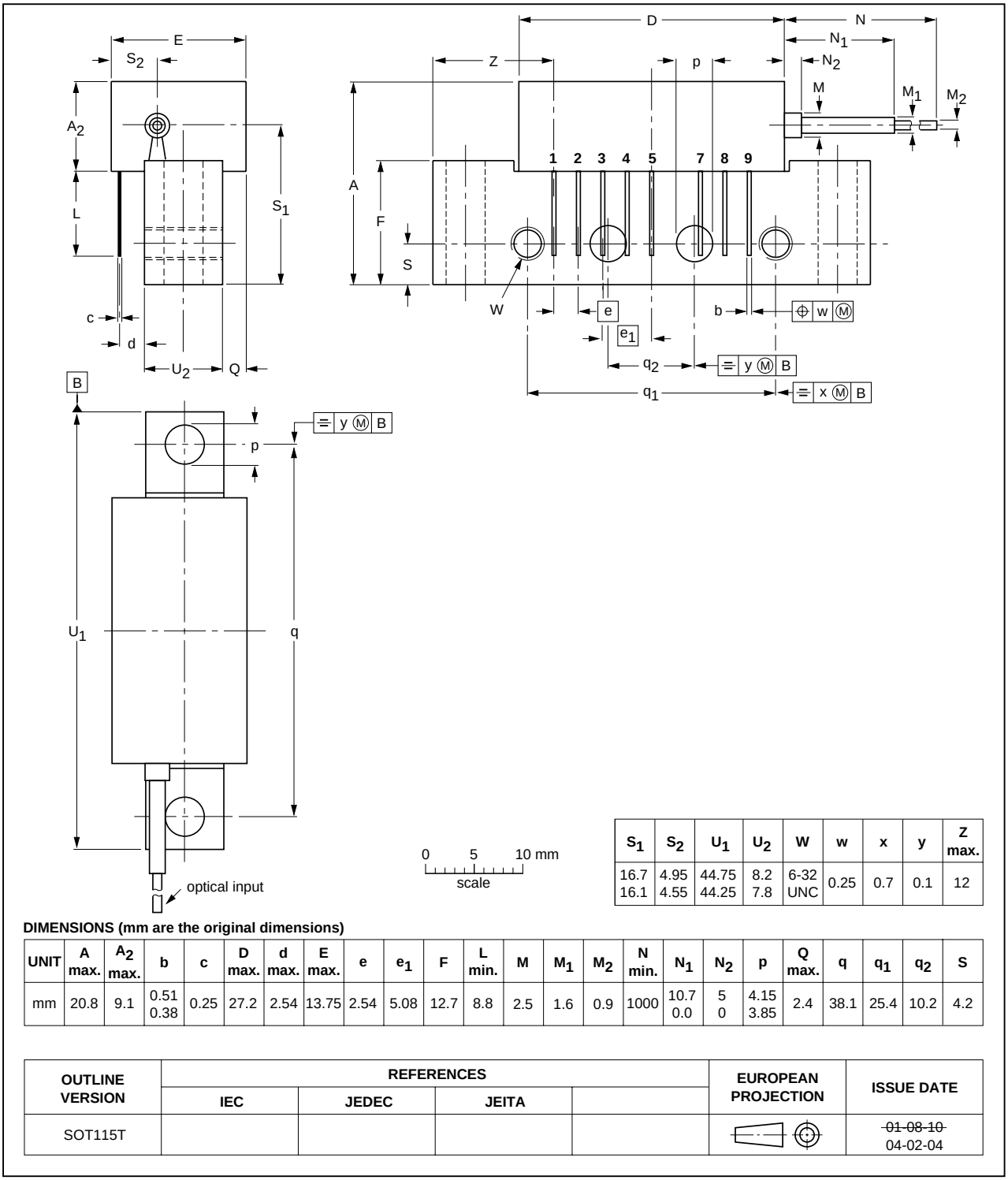


Fig 1. Monitor current pin

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_1	S_2	U_1	U_2	W	w	x	y	Z max.
16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

DIMENSIONS (mm are the original dimensions)

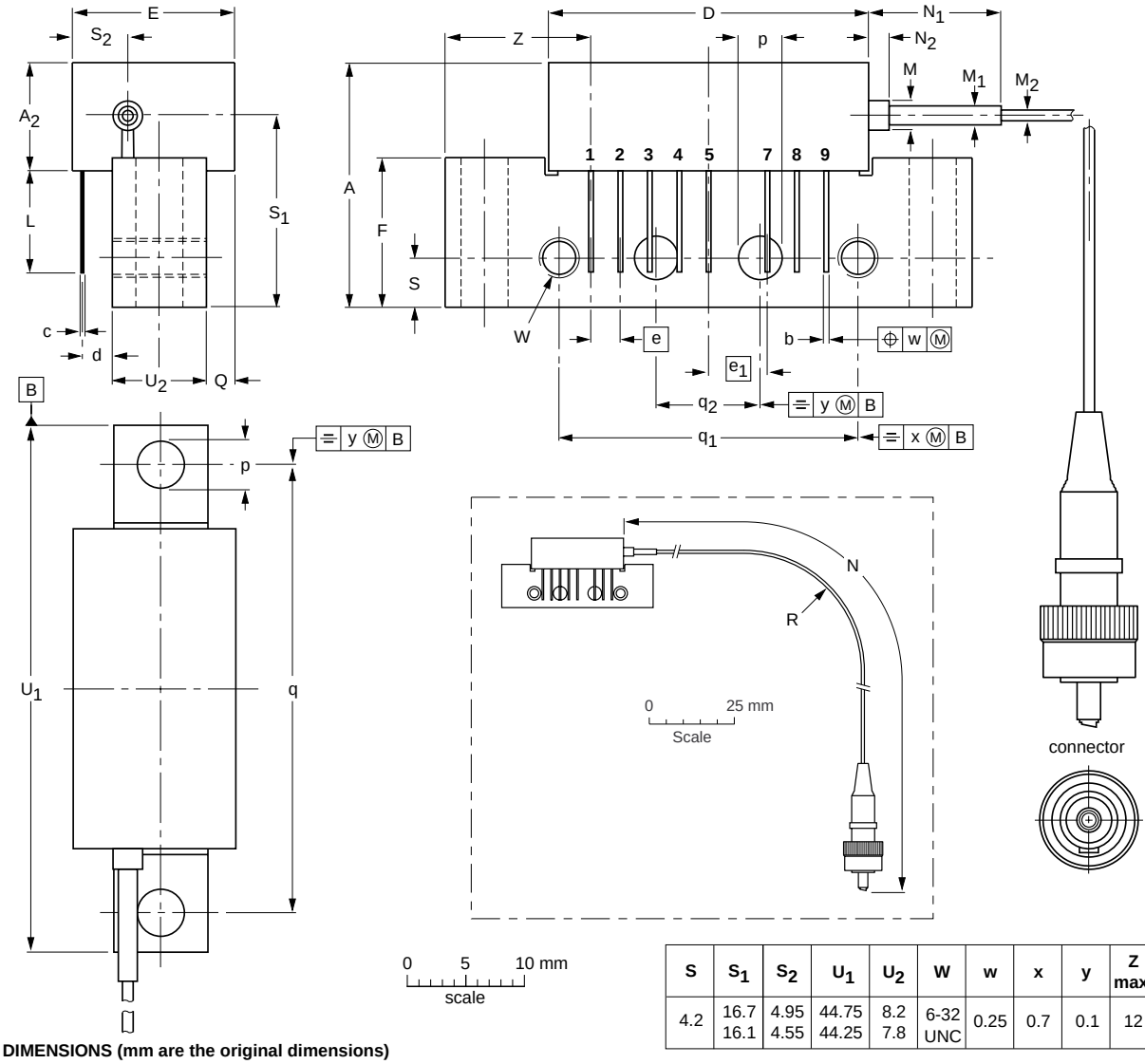
UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N min.	N_1	N_2	p	Q max.	q	q_1	q_2	S
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	1000	10.7 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	4.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115T						~~01-08-10~~ 04-02-04

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



S	S_1	S_2	U_1	U_2	W	w	x	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

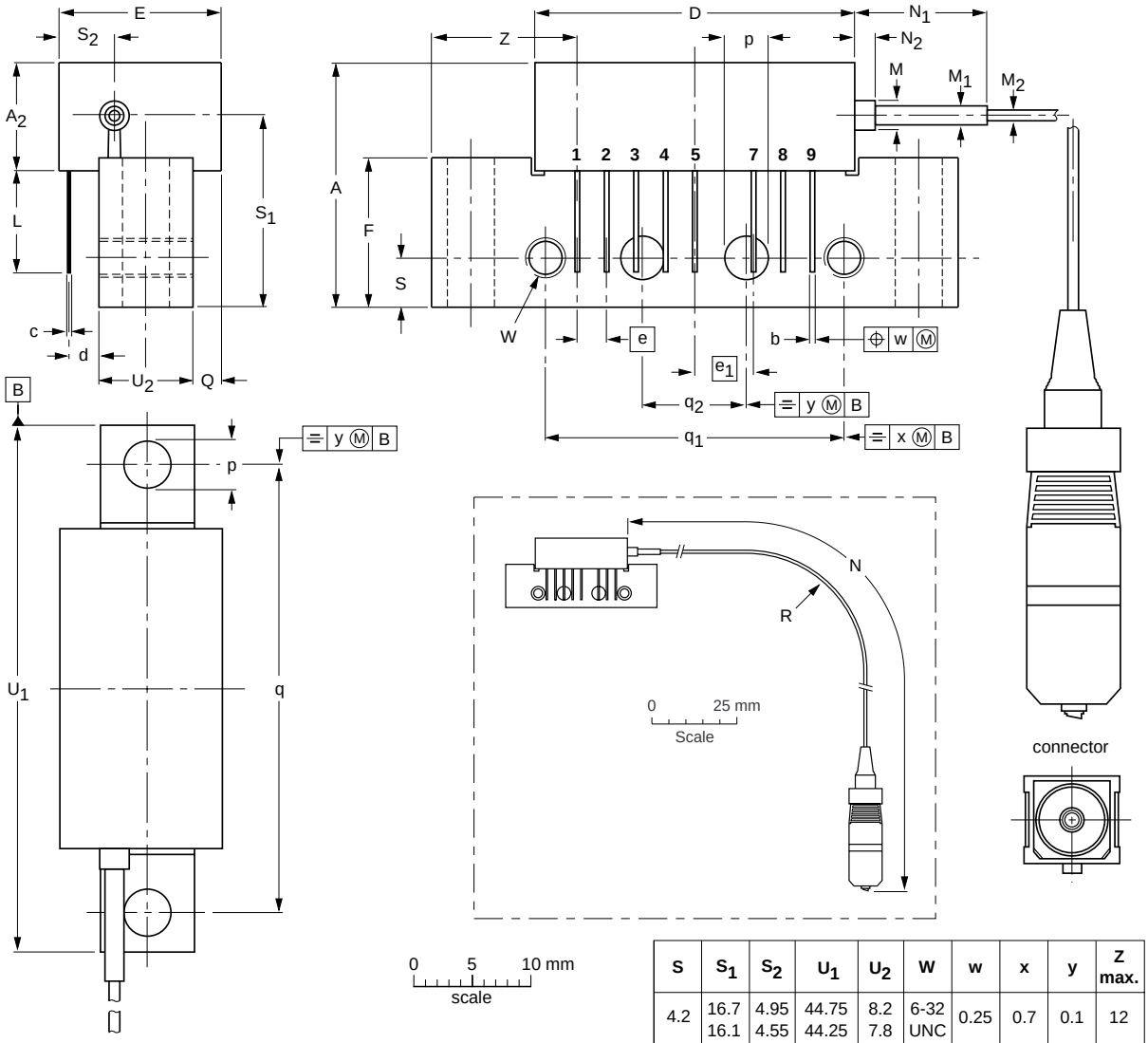
DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1	N_2	p	Q max.	q	q_1	q_2	R min.
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 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115X						~~01-08-10~~ 04-02-04

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**



S	S_1	S_2	U_1	U_2	W	w	x	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1	N_2	p	Q max.	q	q_1	q_2	R min.
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 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115Y						~~01-08-10~~ 04-02-05

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	Doc. number	Supersedes
BGO827_FC0_SC0_4	20050329	Product data sheet	-	9397 750 14436	BGO827_FC0_SC0_3
Modifications:	• The format of this data sheet has been redesigned to comply with the new representation and information standard of Philips Semiconductors.				
BGO827_FC0_SC0_3	20040407	Product specification	-	9397 750 13061	BGO827_FC0_SC0_2
BGO827_FC0_SC0_2	20021210	Product specification	-	9397 750 10522	BGO827_FC0_SC0_1
BGO827_FC0_SC0_1	20020627	Product specification	-	9397 750 09934	-

9. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	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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[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.

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13. Contents

Date of release: 29 March 2005
Document number: 9397 750 14436

Published in The Netherlands