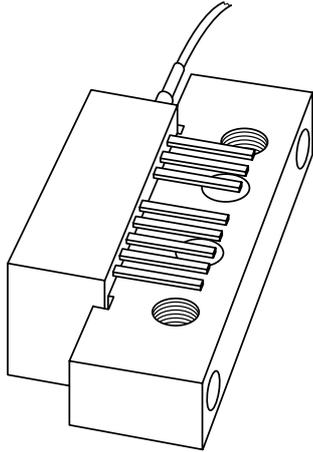


# DATA SHEET



**BGO847; BGO847/FC0;  
BGO847/SC0**  
870 MHz optical receiver

Product specification  
Supersedes data of 2000 Apr 12

2001 Oct 19

# 870 MHz optical receiver

# BGO847; BGO847/FC0; BGO847/SC0

**FEATURES**

- Improved BGE847BO
- Excellent linearity
- Extremely low noise up to 870 MHz
- Excellent flatness (straight line)
- 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**

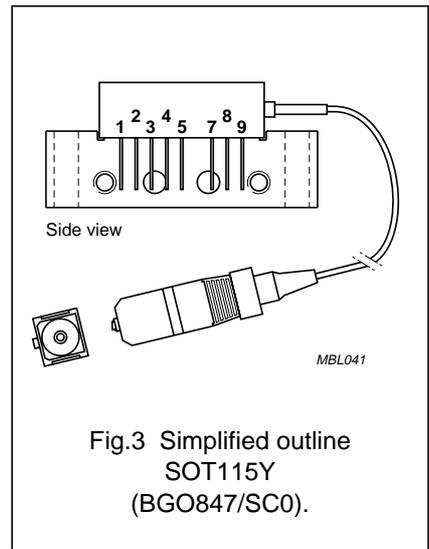
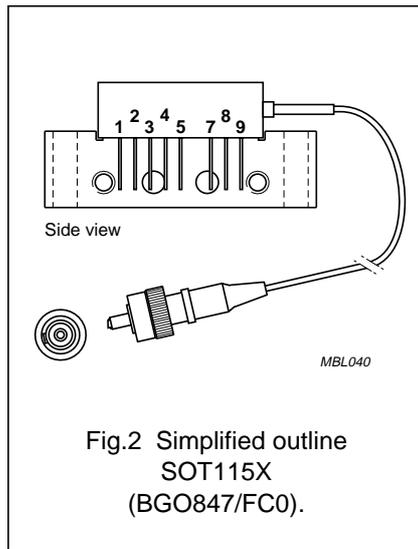
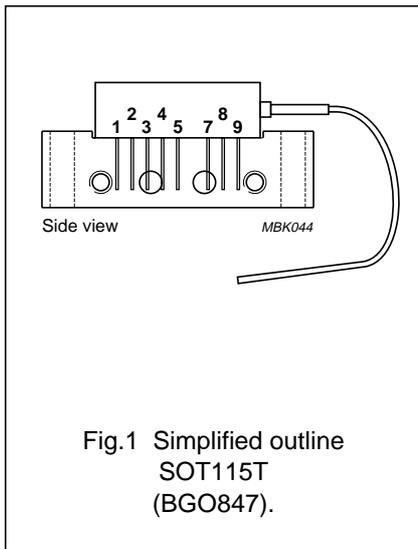
High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fibre has either no connector or an FC/APC or an SC/APC connector.

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	–	–63	dBc
F	equivalent noise input	f = 40 to 750 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.

## 870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/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>L</sub> = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
S	responsivity BGO847 BGO847/FC0, BGO847/SC0	λ = 1300 nm	800	-	V/W
		λ = 1300 nm	750	-	V/W
FL	flatness straight line	peak to valley; f = 40 to 870 MHz	-	1	dB
SL	slope straight line	f = 40 to 870 MHz	0	2	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> = 54 MHz; notes 1 and 3	-	-73	dB
		f <sub>m</sub> = 446.5 MHz; notes 1 and 4	-	-68	dB
		f <sub>m</sub> = 548.5 MHz; notes 1 and 5	-	-67	dB
		f <sub>m</sub> = 746.5 MHz; notes 1 and 6	-	-63	dB
		f <sub>m</sub> = 854.5 MHz; notes 1 and 7	-	-63	dB
d <sub>3</sub>	third order distortion	f <sub>m</sub> = 55.25 MHz; notes 2 and 8	-	-80	dB
		f <sub>m</sub> = 445.25 MHz; notes 2 and 9	-	-75	dB
		f <sub>m</sub> = 547.25 MHz; notes 2 and 10	-	-75	dB
		f <sub>m</sub> = 745.25 MHz; notes 2 and 11	-	-75	dB
		f <sub>m</sub> = 853.25 MHz; notes 2 and 12	-	-73	dB
F	equivalent input noise	f = 40 to 750 MHz	-	7	pA/√Hz
		f = 750 to 870 MHz	-	8	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 BGO847 BGO847/FC0, BGO847/SC0	fibre; SM type; 9/125 μm	1	-	m
		fibre; SM type; 9/125 μm	746	861	mm
I <sub>tot</sub>	total current consumption (DC)		175	205	mA
I <sub>pin 4</sub>	pin diode bias current (DC)		-	25	mA

## 870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/SC0**Notes**

1. Two laser test; each laser with 40% modulation index;  $P_{opt} = 1$  mW (total).
2. Three laser test; each laser with 60% modulation index;  $P_{opt} = 1$  mW (total).
3.  $f_m = 54$  MHz;  $f_p = 187.25$  MHz;  $f_q = 133.25$  MHz.
4.  $f_m = 446.5$  MHz;  $f_p = 97.25$  MHz;  $f_q = 349.25$  MHz.
5.  $f_m = 548.5$  MHz;  $f_p = 109.25$  MHz;  $f_q = 439.25$  MHz.
6.  $f_m = 746.5$  MHz;  $f_p = 133.25$  MHz;  $f_q = 613.25$  MHz.
7.  $f_m = 854.5$  MHz;  $f_p = 133.25$  MHz;  $f_q = 721.25$  MHz.
8.  $f_m = 55.25$  MHz;  $f_p = 109.25$  MHz;  $f_q = 133.25$  MHz  $f_r = 187.25$  MHz.
9.  $f_m = 445.25$  MHz;  $f_p = 193.25$  MHz;  $f_q = 349.25$  MHz  $f_r = 97.25$  MHz.
10.  $f_m = 547.25$  MHz;  $f_p = 217.25$  MHz;  $f_q = 439.25$  MHz  $f_r = 109.25$  MHz.
11.  $f_m = 745.25$  MHz;  $f_p = 133.25$  MHz;  $f_q = 265.25$  MHz  $f_r = 613.25$  MHz.
12.  $f_m = 853.25$  MHz;  $f_p = 133.25$  MHz;  $f_q = 265.25$  MHz  $f_r = 721.25$  MHz.

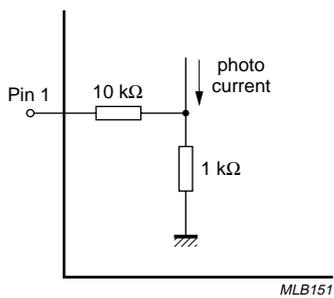


Fig.4 Monitor current pin.

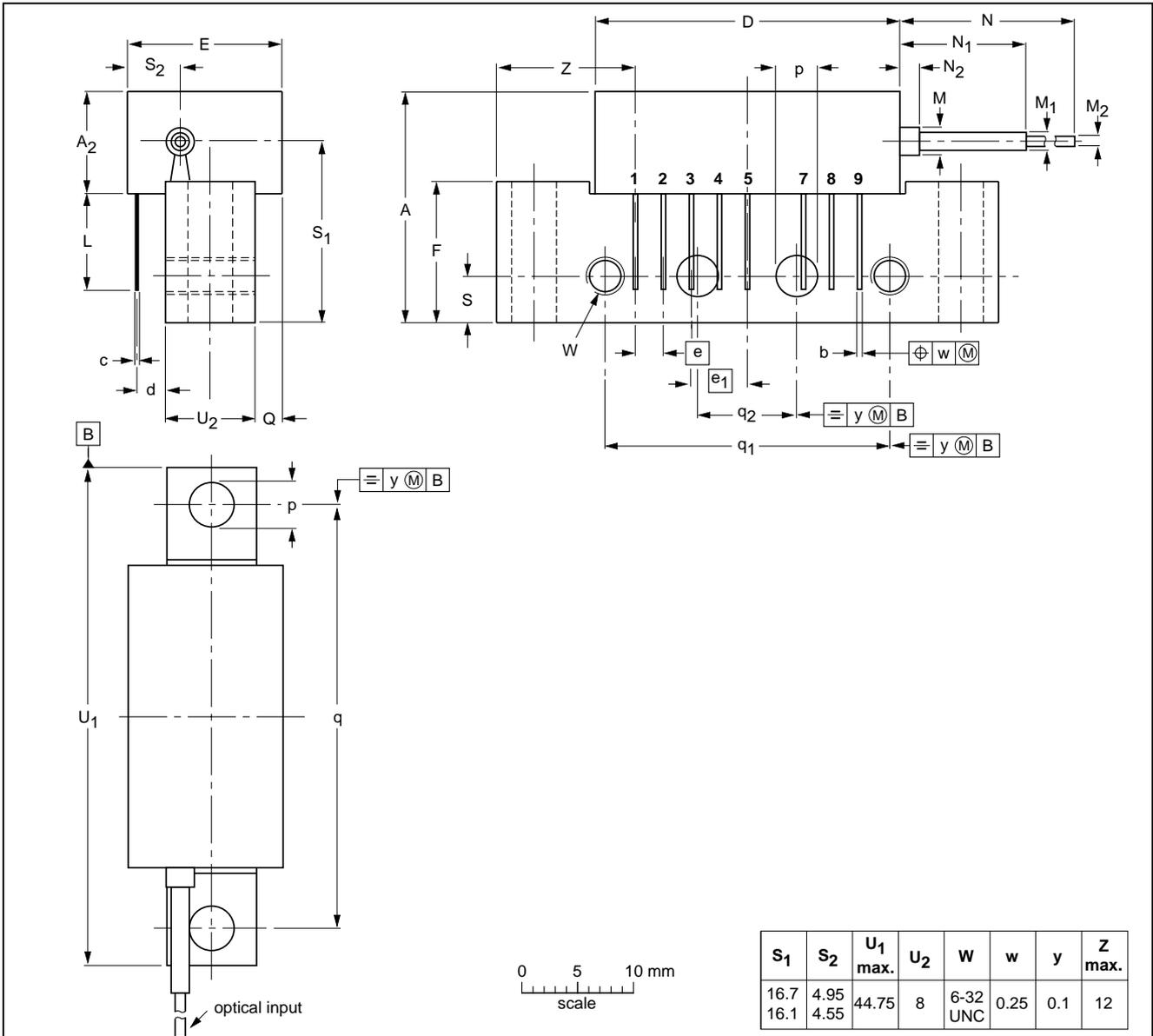
870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/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



S <sub>1</sub>	S <sub>2</sub>	U <sub>1</sub> max.	U <sub>2</sub>	W	w	y	Z max.
16.7	4.95	44.75	8	6-32 UNC	0.25	0.1	12
16.1	4.55						

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> max.	N <sub>2</sub> max.	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	5	4.15 3.85	2.4	38.1	25.4	10.2	4.2

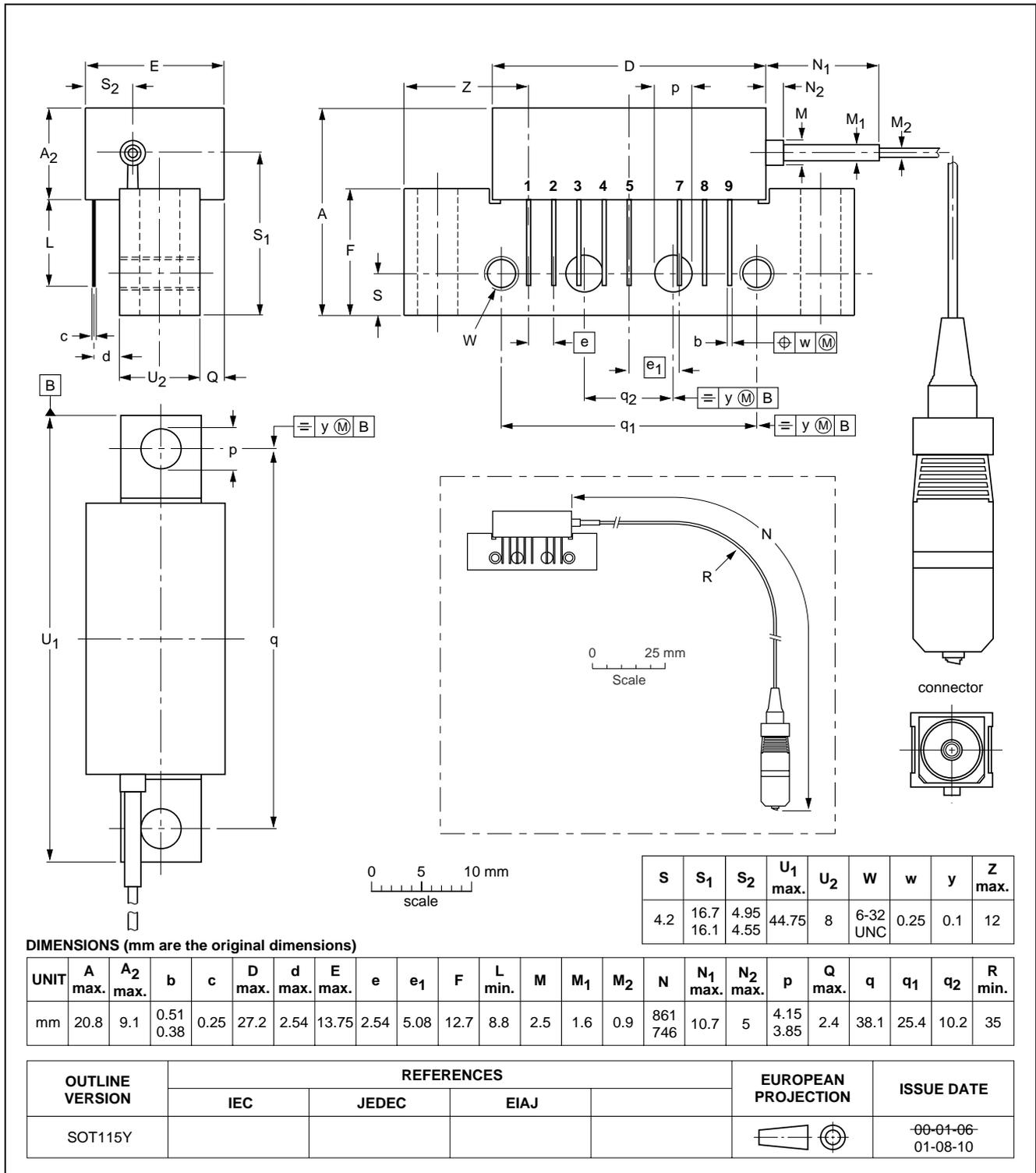
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115T						99-04-13 01-08-10

870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/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

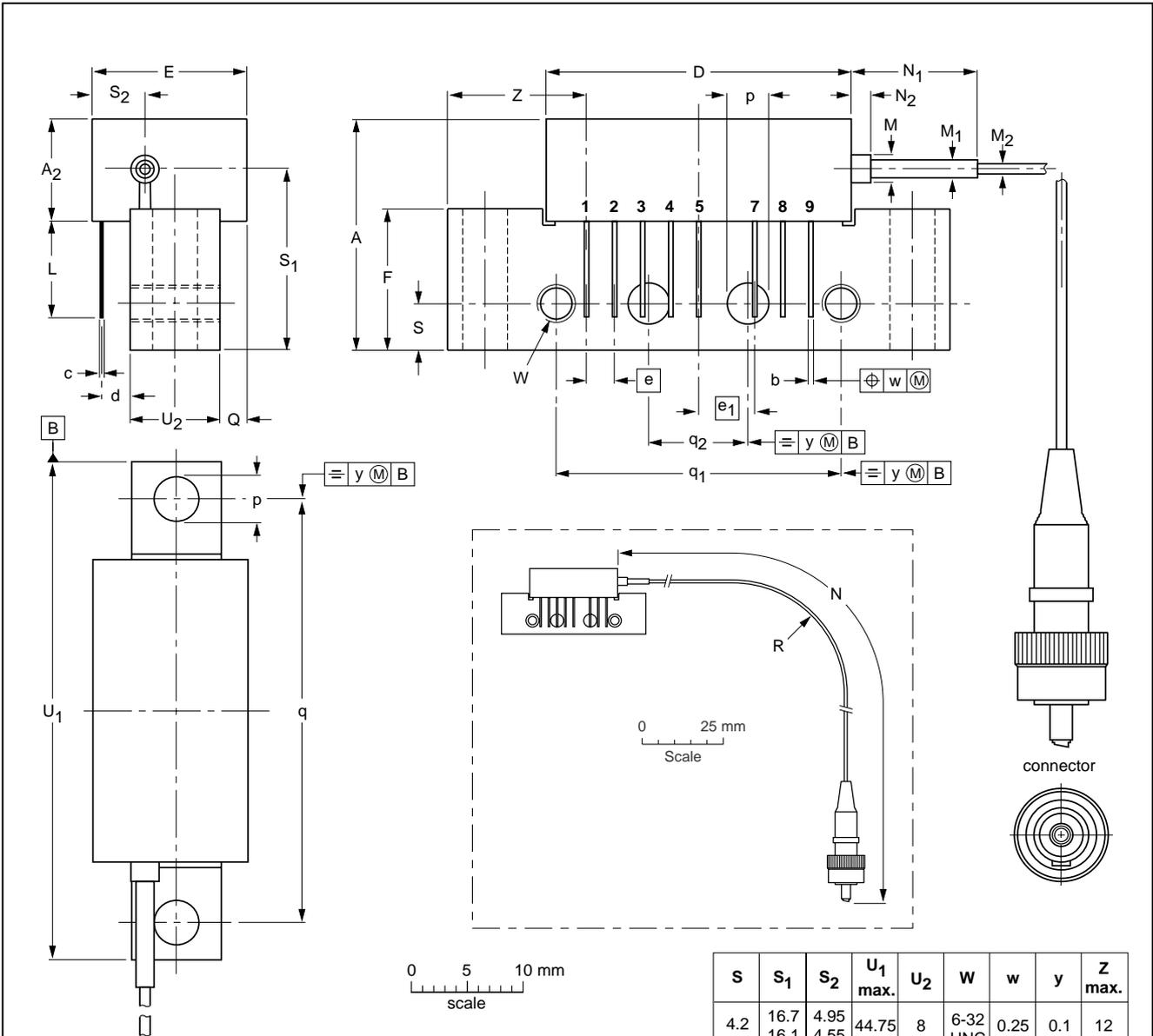


870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/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> max.	N <sub>2</sub> max.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	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	5	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115X						00-01-06- 01-08-10

## 870 MHz optical receiver

BGO847; BGO847/FC0;  
BGO847/SC0

## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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.
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.
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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.

870 MHz optical receiver

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BGO847/SC0

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**NOTES**

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870 MHz optical receiver

BGO847; BGO847/FC0;  
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**NOTES**

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BGO847/SC0

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**NOTES**

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