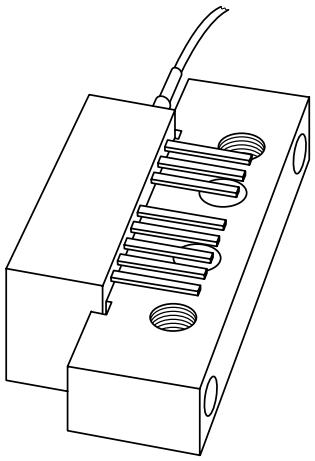
DATA SHEET



BGO847
870 MHz optical receiver

Product specification
Supersedes data of 2002 Dec 10

2003 Nov 06

Philips
Semiconductors

PHILIPS

870 MHz optical receiver BGO847

FEATURES

- 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 module in a standard SOT115T package where the non-jacketed fibre has no connector.

The amplifier supply voltage pin and the photo diode bias voltage pin both connect to 24 V (DC).

The module has 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	$+V_B$ of the photo diode
5	$+V_B$ of the amplifier
7	common
8	common
9	output

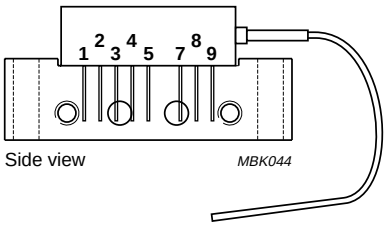


Fig.1 Simplified outline SOT115T.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	870	MHz
s_{22}	output return losses	f = 40 to 870 MHz	11	–	dB
	optical input return losses		45	–	dB
d_2	second order distortion	f = 854.5 MHz	–	–63	dB
F	equivalent noise input	f = 40 to 750 MHz	–	7	pA/√Hz
I_{tot}	total current consumption (DC)	V_B = 24 V	175	205	mA

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.

HANDLING

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

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BGO847	–	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; optical input; 9 gold-plated in-line leads	SOT115T

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}	operating 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

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
S	responsivity	λ = 1300 nm	800	–	–	V/W
ΔS	responsivity difference	resp at T_{mb} = 85 °C – resp at T_{mb} = 30 °C; f = 870 MHz	–	–50	–	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
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 to 870 MHz	11	–	–	dB
	optical input return losses		40	–	–	dB
d_2	second order distortion	f_m = 54 MHz; notes 1 and 3	–	–	–73	dB
		f_m = 446.5 MHz; notes 1 and 4	–	–	–68	dB
		f_m = 548.5 MHz; notes 1 and 5	–	–	–67	dB
		f_m = 746.5 MHz; notes 1 and 6	–	–	–63	dB
		f_m = 854.5 MHz; notes 1 and 7	–	–	–63	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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
d_3	third order distortion	f_m = 55.25 MHz; notes 2 and 8	–	–	–80	dB
		f_m = 445.25 MHz; notes 2 and 9	–	–	–75	dB
		f_m = 547.25 MHz; notes 2 and 10	–	–	–75	dB
		f_m = 745.25 MHz; notes 2 and 11	–	–	–75	dB
		f_m = 853.25 MHz; notes 2 and 12	–	–	–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 input noise	f = 40 to 750 MHz	–	–	7	pA/√Hz
		f = 750 to 870 MHz	–	–	8	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 fibre	fibre; SM type; 9/125 µm	1	–	–	m
I_{tot}	total current consumption (DC)	T_{mb} = –20 °C to +85 °C	175	–	205	mA
I_{bias}	diode bias current at pin 4 (DC)		–	–	25	mA

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.

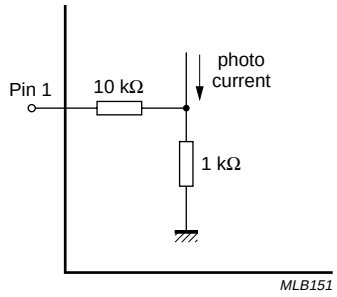
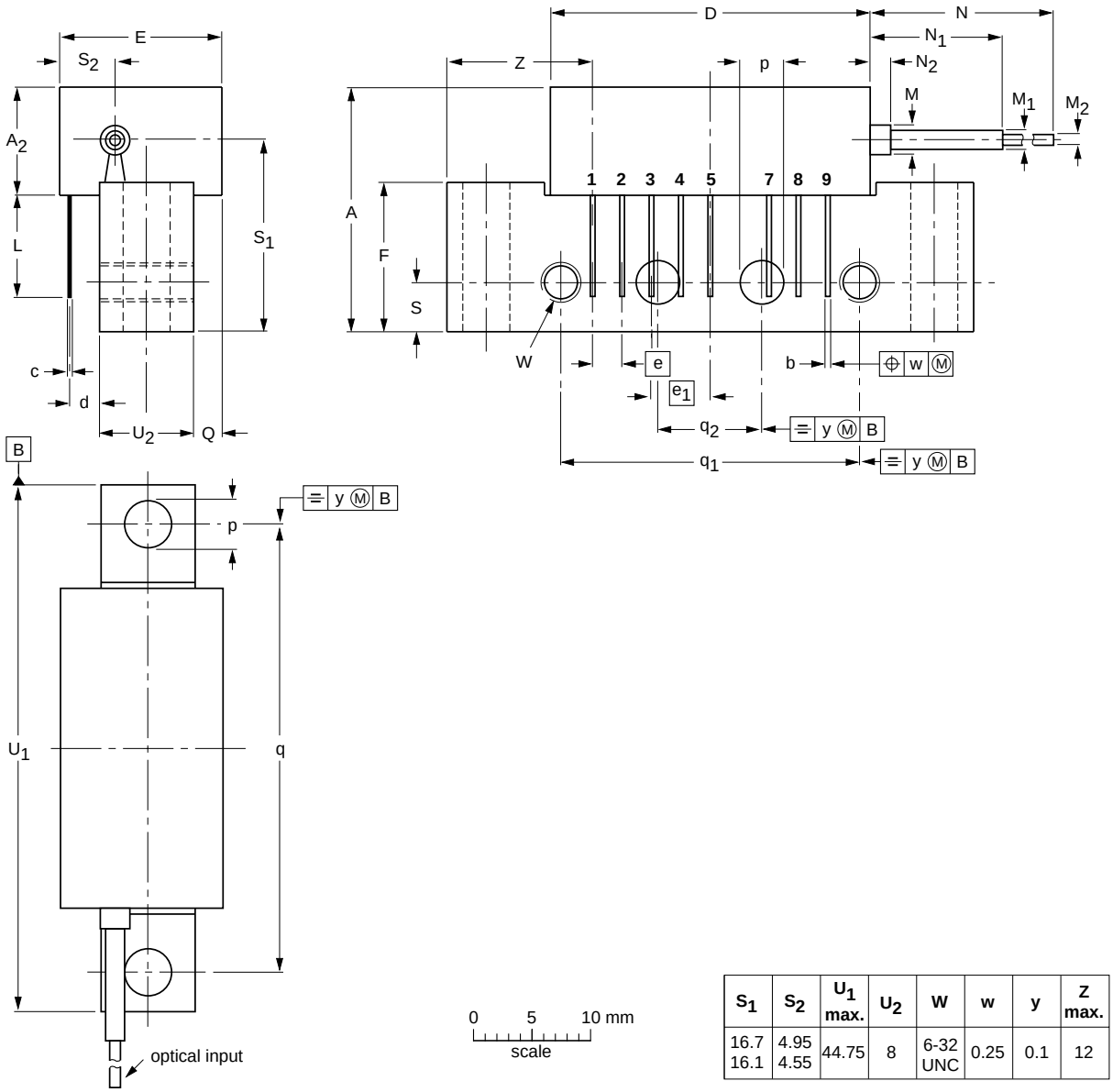


Fig.2 Monitor current pin.

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 max.	U_2	W	w	y	Z max.
16.7 16.1	4.95 4.55	44.75	8	6-32 UNC	0.25	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 max.	N_2 max.	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	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

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

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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.

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Printed in The Netherlands R77/07/pp8 Date of release: 2003 Nov 06 Document order number: 9397 750 11913

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