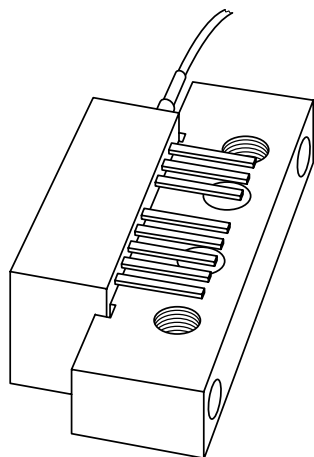


DATA SHEET



BGO847 870 MHz optical receiver

Product specification
Supersedes data of 2002 Dec 10

2003 Nov 06

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

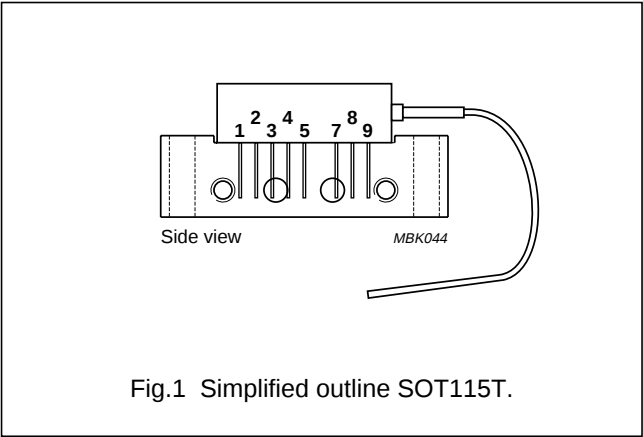


Fig.1 Simplified outline SOT115T.

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.

870 MHz optical receiver

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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	$\lambda = 1300$ 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

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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/ $\sqrt{\text{Hz}}$
		$f = 750$ to 870 MHz	–	–	8	pA/ $\sqrt{\text{Hz}}$
S_λ	spectral sensitivity	$\lambda = 1310 \pm 20$ nm	0.85	–	–	A/W
		$\lambda = 1550 \pm 20$ 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

- Two laser test; each laser with 40% modulation index; $P_{\text{opt}} = 1$ mW (total).
- Three laser test; each laser with 60% modulation index; $P_{\text{opt}} = 1$ mW (total).
- $f_m = 54$ MHz; $f_p = 187.25$ MHz; $f_q = 133.25$ MHz.
- $f_m = 446.5$ MHz; $f_p = 97.25$ MHz; $f_q = 349.25$ MHz.
- $f_m = 548.5$ MHz; $f_p = 109.25$ MHz; $f_q = 439.25$ MHz.
- $f_m = 746.5$ MHz; $f_p = 133.25$ MHz; $f_q = 613.25$ MHz.
- $f_m = 854.5$ MHz; $f_p = 133.25$ MHz; $f_q = 721.25$ MHz.
- $f_m = 55.25$ MHz; $f_p = 109.25$ MHz; $f_q = 133.25$ MHz $f_r = 187.25$ MHz.
- $f_m = 445.25$ MHz; $f_p = 193.25$ MHz; $f_q = 349.25$ MHz $f_r = 97.25$ MHz.
- $f_m = 547.25$ MHz; $f_p = 217.25$ MHz; $f_q = 439.25$ MHz $f_r = 109.25$ MHz.
- $f_m = 745.25$ MHz; $f_p = 133.25$ MHz; $f_q = 265.25$ MHz $f_r = 613.25$ MHz.
- $f_m = 853.25$ MHz; $f_p = 133.25$ MHz; $f_q = 265.25$ MHz $f_r = 721.25$ MHz.

870 MHz optical receiver

BGO847

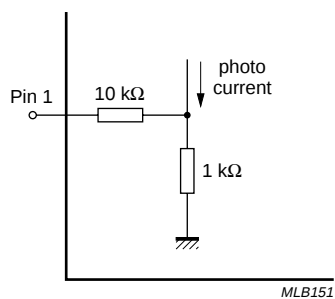


Fig.2 Monitor current pin.

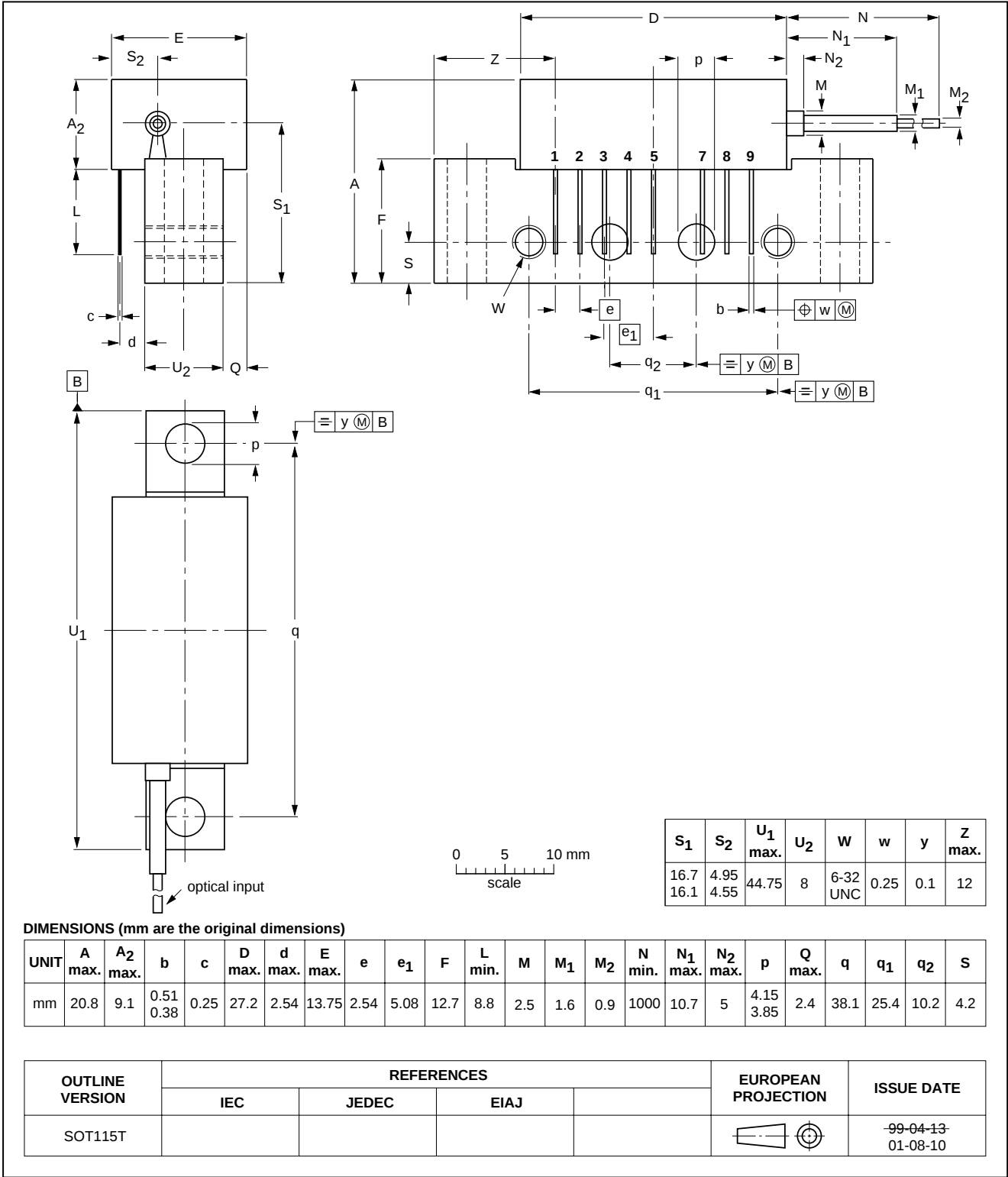
870 MHz optical receiver

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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



870 MHz optical receiver

BGO847

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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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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