# DISCRETE SEMICONDUCTORS



Product specification Supersedes data of 2002 Dec 10 2004 Apr 07



#### FEATURES

- Excellent linearity
- Low noise
- Excellent flatness
- 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 has an FC/APC or SC/APC connector.

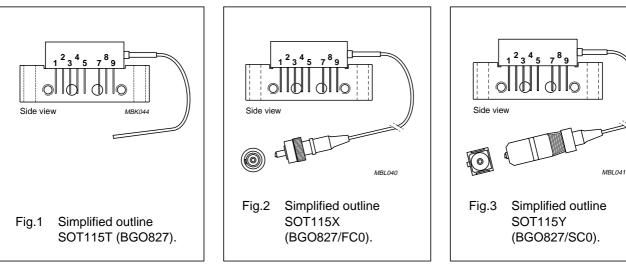
The amplifier supply voltage pin and the photo diode bias voltage pin both connect to 24 V (DC).

The modules have a 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  $\Omega$ .

# BGO827; BGO827/FC0; BGO827/SC0

#### 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
\$ <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	-	-57	dB
F	equivalent noise input	f = 40 to 870 MHz	-	8.5	pA/√Hz
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 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.

# BGO827; BGO827/FC0; BGO827/SC0

#### **ORDERING INFORMATION**

TYPE NUMBER	PACKAGE				
ITPE NUMBER	NAME	NAME DESCRIPTION			
BGO827	_	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			
BGO827/FC0	_	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			
BGO827/SC0	<ul> <li>D827/SC0 – rectangular single-ended package; aluminium flange;</li> <li>2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounholes; optical input with connector; 8 gold-plated in-line leads</li> </ul>		SOT115Y		

#### HANDLING

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

#### 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
Pin	optical input power	continuous	-	5	mW
ESD	ESD sensitivity	human body model; R = 1.5 k $\Omega$ ; C = 100 pF	500	_	V

#### CHARACTERISTICS

Bandwidth 40 to 870 MHz; V\_B = 24 V; T\_{mb} = 30 °C; ZL = 75  $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
S	responsivity	$\lambda = 1300 \text{ nm}$				
	BGO827		800	_	-	V/W
	BGO827/FC0, BGO827/SC0		750	-	-	V/W
ΔS	responsivity difference	resp at T <sub>mb</sub> = 85 °C – resp at T <sub>mb</sub> = 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
∆SL	slope difference	slope at $T_{mb} = 85 \text{ °C} - \text{slope at}$ $T_{mb} = 30 \text{ °C}$	-	-0.35	-	dB
\$ <sub>22</sub>	output return losses	f = 40 to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB

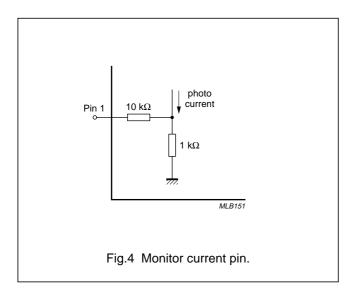
# BGO827; BGO827/FC0; BGO827/SC0

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
d <sub>2</sub>	second order distortion	f <sub>m</sub> = 446.5 MHz; notes 1 and 3	_	-	-68	dB
		f <sub>m</sub> = 746.5 MHz; notes 1 and 4	_	_	-63	dB
		f <sub>m</sub> = 854.5 MHz; notes 1 and 5	_	_	-57	dB
$\Delta d_2$	second order distortion difference	$d_2$ at $T_{mb}$ = 85 °C – $d_2$ at $T_{mb}$ = 30 °C	-	2.5	-	dB
		$d_2$ at $T_{mb} = -20 \text{ °C} - d_2$ at $T_{mb} = 30 \text{ °C}$	-	-1.5	-	dB
d <sub>3</sub>	third order distortion	f <sub>m</sub> = 853.25 MHz; notes 2 and 6	-	_	-73	dB
$\Delta d_3$	third order distortion difference	$d_3$ at $T_{mb}$ = 85 °C – $d_3$ at $T_{mb}$ = 30 °C	-	1	-	dB
		$d_3$ at $T_{mb} = -20 \text{ °C} - d_3$ at $T_{mb} = 30 \text{ °C}$	-	-1	-	dB
F	equivalent noise input	f = 40 to 450 MHz	-	-	7	pA/√Hz
		f = 450 to 750 MHz	-	-	8	pA/√Hz
		f = 750 to 870 MHz	-	-	8.5	pA/√Hz
s <sub>λ</sub>	spectral sensitivity	$\lambda = 1310 \pm 20 \text{ nm}$	0.85	-	-	A/W
		$\lambda = 1550 \pm 20 \text{ nm}$	0.9	-	-	A/W
λ	optical wavelength		1290	_	1600	nm
L	length of optical fibre	fibre; SM type; 9/125 μm				
	BGO827		1	_	-	m
	BGO827/FC0, BGO827/SC0		746	_	861	mm
I <sub>tot</sub>	total current consumption (DC)		175	_	205	mA
I <sub>bias</sub>	diode bias current at pin 4 (DC)		-	-	25	mA

#### Notes

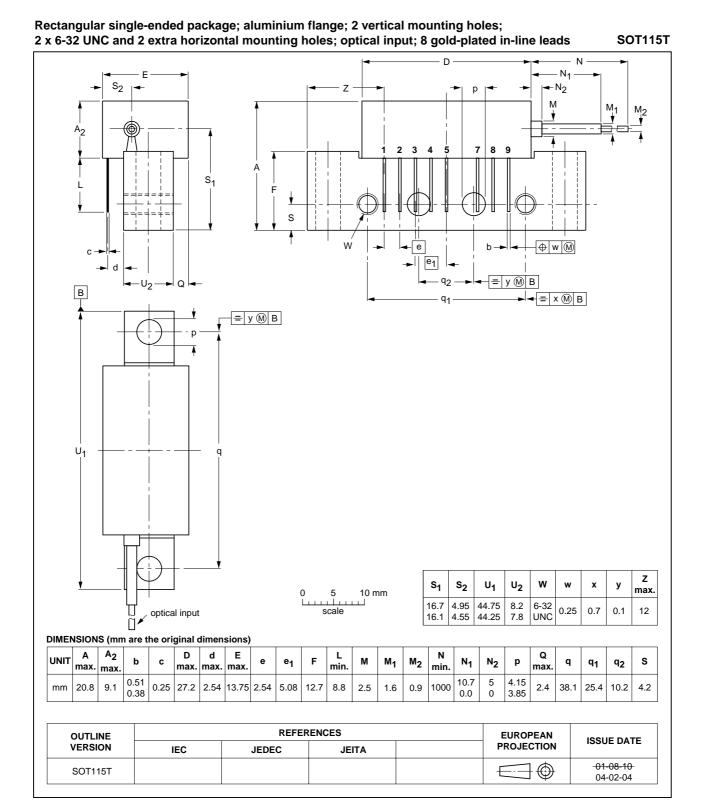
- 1. Two laser test; each laser with a modulation index of 40%; P<sub>opt</sub> = 1 mW (total).
- 2. Three laser test; each laser with a modulation index of 60%;  $P_{opt} = 1 \text{ mW}$  (total).
- 3.  $f_m = 446.5 \text{ MHz}; f_p = 97.25 \text{ MHz}; f_q = 349.25 \text{ MHz}.$
- 4.  $f_m = 746.5 \text{ MHz}; f_p = 133.25 \text{ MHz}; f_q = 613.25 \text{ MHz}.$
- 5.  $f_m = 854.5 \text{ MHz}; f_p = 133.25 \text{ MHz}; f_q = 721.25 \text{ MHz}.$
- 6.  $f_m = 853.25 \text{ MHz}; f_p = 133.25 \text{ MHz}; f_q = 265.25 \text{ MHz}; f_r = 721.25 \text{ MHz}.$

## BGO827; BGO827/FC0; BGO827/SC0

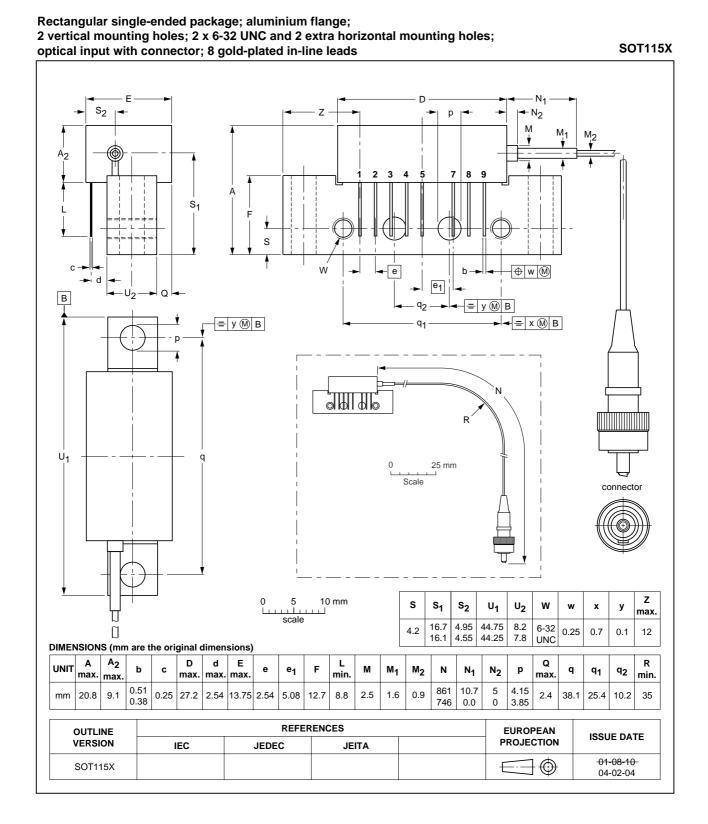


# BGO827; BGO827/FC0; BGO827/SC0

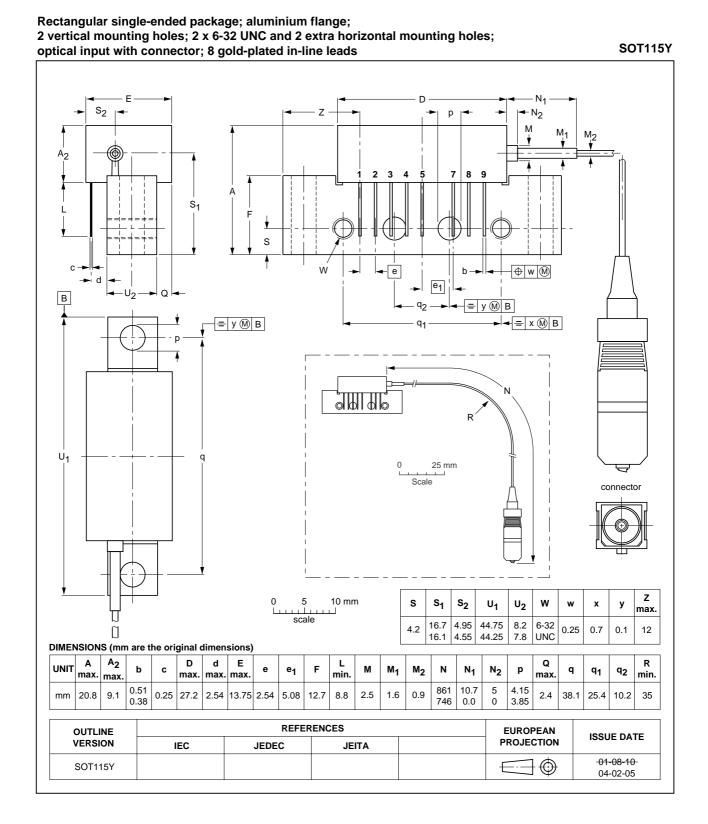
#### PACKAGE OUTLINES



### BGO827; BGO827/FC0; BGO827/SC0



### BGO827; BGO827/FC0; BGO827/SC0



# BGO827; BGO827/FC0; BGO827/SC0

#### DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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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