



# BGO807C/FC0; BGO807C/SC0

870 MHz optical receivers

Rev. 1 — 25 April 2013

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 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  $\Omega$ .

### 1.2 Features and benefits

- 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.

### 1.4 Quick reference data

**Table 1. Quick reference data**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency		40	-	870	MHz
RL <sub>out</sub>	output return loss		11	-	-	dB
RL <sub>in</sub>	input return loss	optical	45	-	-	dB
IMD2	second-order intermodulation distortion	f = 854.5 MHz	[1][2]	-	-55	dB
I <sub>n(i)eq</sub>	equivalent input noise current	f = 750 MHz to 870 MHz	-	-	8.5	pA/ $\sqrt{\text{Hz}}$
I <sub>tot</sub>	total current	DC	175	-	205	mA

[1] Two laser test; each laser with a modulation index of 40 %; optical power = 1 mW (total).

[2] measured at f = 854.5 MHz with f<sub>1</sub> = 133.25 MHz; f<sub>2</sub> = 721.25 MHz.



## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Symbol
<b>BGO807C/FC0 SOT115X)</b>			
1	monitor current		 sym098
2	common		
3	common		
4	+V <sub>B</sub> of the photodiode		
5	+V <sub>B</sub> of the amplifier		
7	common		
8	common		
9	output		
<b>BGO807C/SC0 SOT115Y)</b>			
1	monitor current		 sym098
2	common		
3	common		
4	+V <sub>B</sub> of the photodiode		
5	+V <sub>B</sub> of the amplifier		
7	common		
8	common		
9	output		

## 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BGO807C/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
BGO807C/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		40	870	MHz
T <sub>stg</sub>	storage temperature		-40	+85	°C
T <sub>mb</sub>	mounting base temperature		-20	+85	°C
P <sub>i</sub>	input power	optical; continuous	-	5	mW
V <sub>ESD</sub>	electrostatic discharge voltage	Human Body Model (HBM); According JEDEC standard 22-A114E; R = 1.5 kΩ; C = 100 pF	-	500	V

## 5. Characteristics

**Table 5. Characteristics**

Bandwidth = 40 MHz 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	Typ	Max	Unit	
S <sub>V</sub>	responsivity	λ = 1300 nm	750	-	-	V/W	
SL <sub>sl</sub>	slope straight line		[1]	0	-	2	dB
FL	flatness of frequency response		[2]	-	-	1	dB
RL <sub>out</sub>	output return loss		11	-	-	dB	
RL <sub>in</sub>	input return loss	optical	45	-	-	dB	
IMD2	second-order intermodulation distortion	measured f = 446.5 MHz	[3][4]	-	-	-66	dB
		measured f = 746.5 MHz	[3][5]	-	-	-61	dB
		measured f = 854.5 MHz	[3][6]	-	-	-55	dB
IMD3	third-order intermodulation distortion	measured f = 853.25 MHz	[7][8]	-	-	-71	dB
I <sub>n(i)eq</sub>	equivalent input noise current	Equivalent Input Noise (EIN)					
		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 <sub>λ</sub>	spectral sensitivity	λ = 1310 nm ± 20 nm	0.85	-	-	A/W	
		λ = 1550 nm ± 20 nm	0.9	-	-	A/W	
λ	wavelength	optical	1290	-	1600	nm	
I <sub>tot</sub>	total current	DC	175	-	205	mA	
I <sub>bias</sub>	bias current	diode biasing at pin 4 (DC)	-	-	25	mA	

[1] G<sub>p</sub> at 870 MHz minus G<sub>p</sub> at 40 MHz.

[2] flatness straight line (peak to valley).

[3] Two laser test; each laser with a modulation index of 40 %; optical power = 1 mW (total).

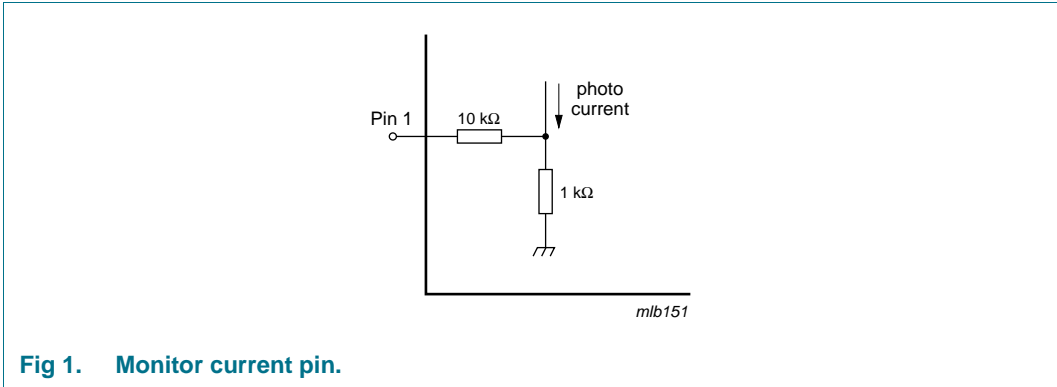
[4] measured at f = 446.5 MHz with f<sub>1</sub> = 97.25 MHz and f<sub>2</sub> = 349.25 MHz.

[5] measured at f = 746.5 MHz with f<sub>1</sub> = 133.25 MHz and f<sub>2</sub> = 613.25 MHz.

[6] measured at f = 854.5 MHz with f<sub>1</sub> = 133.25 MHz; f<sub>2</sub> = 721.25 MHz.

[7] Three laser test; each laser with a modulation index of 60 %; optical power = 1 mW (total).

[8] measured at f = 853.25 MHz with f<sub>1</sub> = 133.25 MHz, f<sub>2</sub> = 265.25 MHz and f<sub>3</sub> = 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 with connector; 8 gold-plated in-line leads

SOT115X

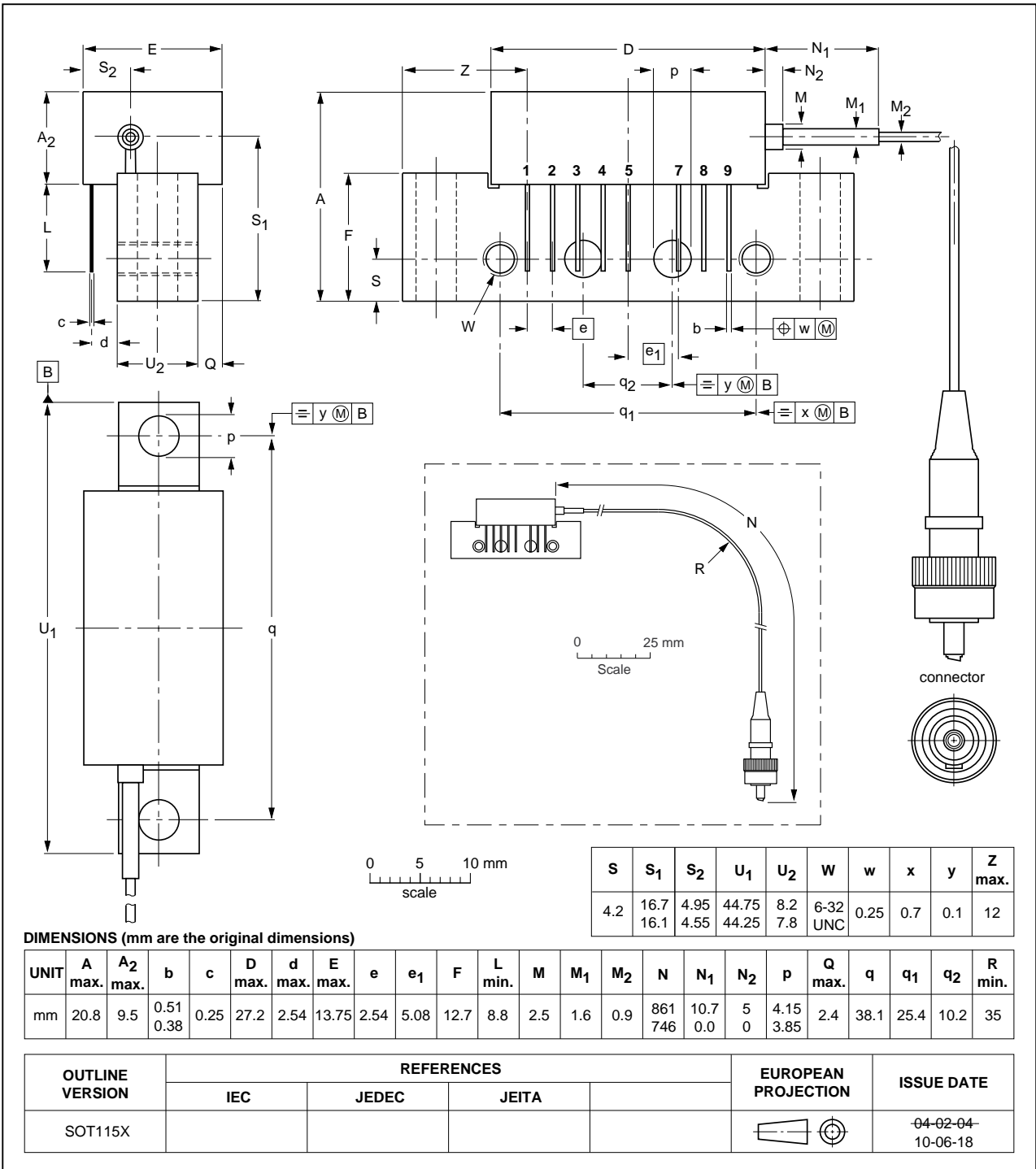


Fig 2. Package outline SOT115X.

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

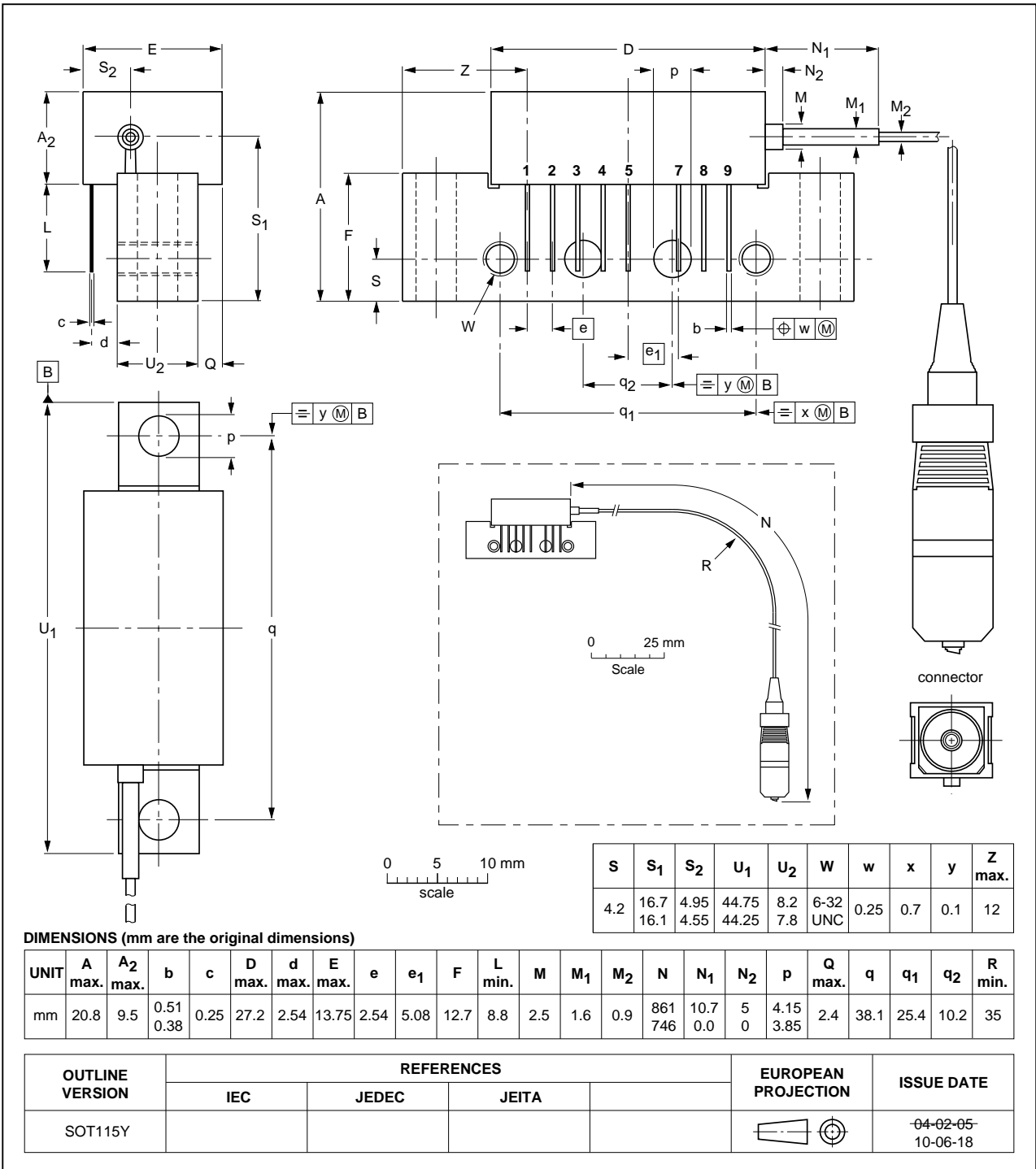


Fig 3. Package outline SOT115Y.

## 7. Handling information

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

## 8. Abbreviations

Table 6. Abbreviations

Acronym	Description
CATV	Community Antenna TeleVision
FC/APC	Fibre-optic Connector/Angled Physical Contact
SC/APC	Subscriber Connector/Angled Physical Contact
UNC	UNified Coarse

## 9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BGO807C_FC0_SC0_1	20130425	Product data sheet	-	-

## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
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Date of release: 25 April 2013

Document identifier: BGO807C\_FC0\_SC0