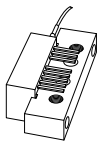


BGO807C/FC0; BGO807C/SC0

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 Ω.

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 Ω.

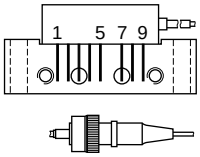
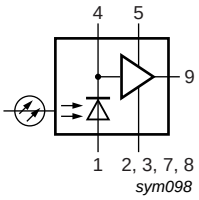
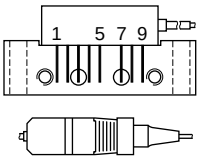
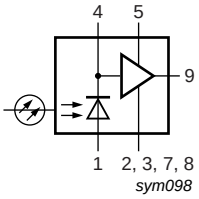
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
f	frequency			40	-	870	MHz
RL_{out}	output return loss			11	-	-	dB
RL_{in}	input return loss	optical		45	-	-	dB
IMD2	second-order intermodulation distortion	f = 854.5 MHz	[1][2]	-	-	–55	dB
$I_{n(i)eq}$	equivalent input noise current	f = 750 MHz to 870 MHz		-	-	8.5	pA/√Hz
I_{tot}	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_1 = 133.25 MHz; f_2 = 721.25 MHz.

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Symbol
BGO807C/FC0 SOT115X)			
1	monitor current		
2	common		
3	common		
4	$+V_B$ of the photodiode		
5	$+V_B$ of the amplifier		
7	common		
8	common		
9	output		
BGO807C/SC0 SOT115Y)			
1	monitor current		
2	common		
3	common		
4	$+V_B$ of the photodiode		
5	$+V_B$ of the amplifier		
7	common		
8	common		
9	output		

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
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_{stg}	storage temperature		−40	+85	°C
T_{mb}	mounting base temperature		−20	+85	°C
P_i	input power	optical; continuous	-	5	mW
V_{ESD}	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_B = 24 V; T_{mb} = 30 °C; Z_L = 75 Ω.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
S_V	responsivity	λ = 1300 nm		750	-	-	V/W
SL_{sl}	slope straight line		[1]	0	-	2	dB
FL	flatness of frequency response		[2]	-	-	1	dB
RL_{out}	output return loss			11	-	-	dB
RL_{in}	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
$I_{n(i)eq}$	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_λ	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_{tot}	total current	DC		175	-	205	mA
I_{bias}	bias current	diode biasing at pin 4 (DC)		-	-	25	mA

[1] G_p at 870 MHz minus G_p 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_1 = 97.25 MHz and f_2 = 349.25 MHz.

[5] measured at f = 746.5 MHz with f_1 = 133.25 MHz and f_2 = 613.25 MHz.

[6] measured at f = 854.5 MHz with f_1 = 133.25 MHz; f_2 = 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_1 = 133.25 MHz, f_2 = 265.25 MHz and f_3 = 721.25 MHz.

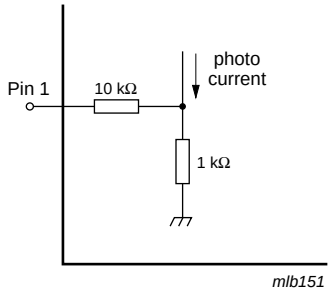
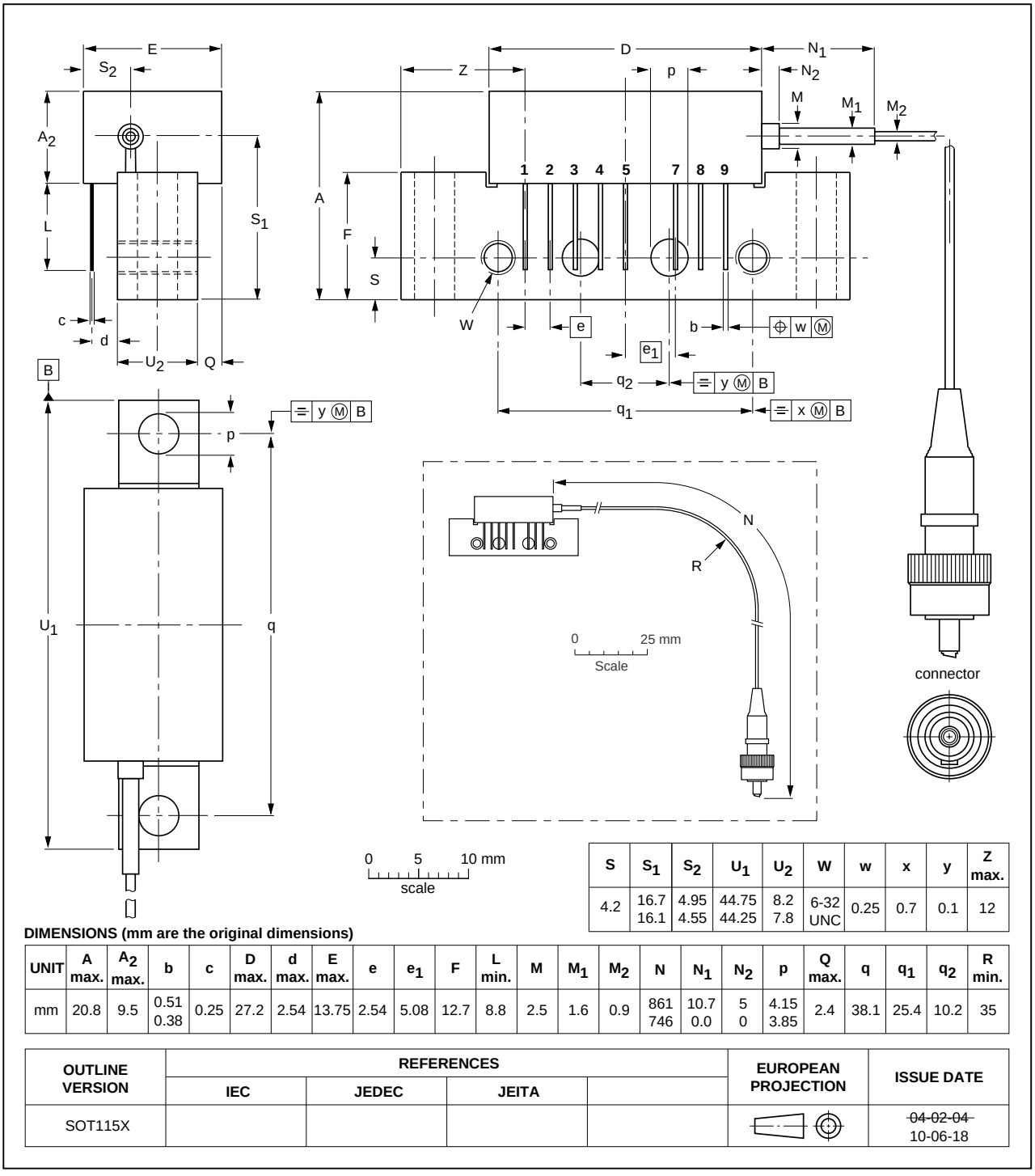


Fig 1. Monitor current pin.

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



S	S_1	S_2	U_1	U_2	W	w	x	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

DIMENSIONS (mm are the original dimensions)

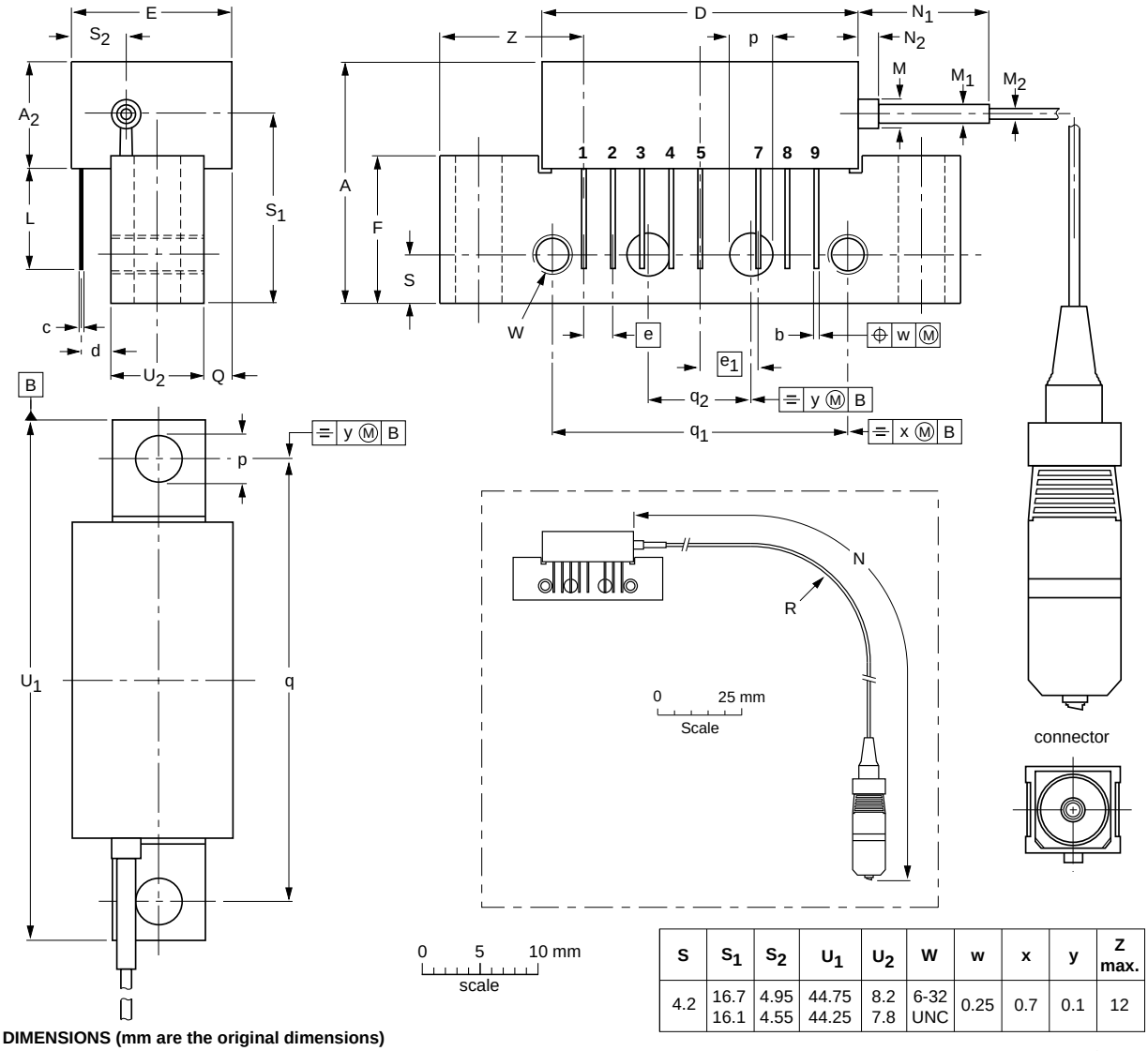
UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1	N_2	p	Q max.	q	q_1	q_2	R min.
mm	20.8	9.5	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	861 746	10.7 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115X						~~04-02-04~~ 10-06-18

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



S	S_1	S_2	U_1	U_2	W	w	x	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	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	N_1	N_2	p	Q max.	q	q_1	q_2	R min.
mm	20.8	9.5	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 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	35

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115Y						~~04-02-05~~ 10-06-18

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[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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