

BGO827; BGO827/FC0; BGO827/SC0

870 MHz optical receivers

Rev. 5 — 29 September 2010 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 no connector or has 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.

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

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.

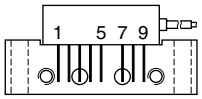
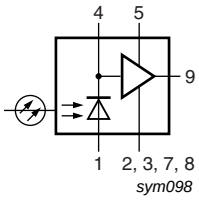
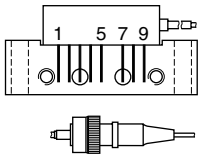
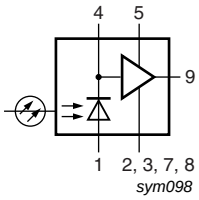
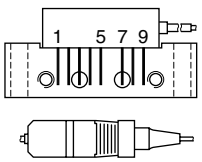
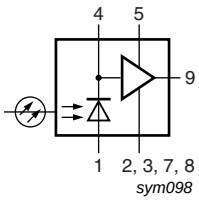
1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
f	frequency range		40	-	870	MHz
s_{22}	output return losses	f = 40 MHz to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB
d_2	second order distortion	f = 854.5 MHz	-	-	–57	dB
F	equivalent noise input	f = 40 MHz to 870 MHz	-	-	8.5	pA/√Hz
I_{tot}	total current consumption (DC)	V_B = 24 V	175	-	205	mA

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
BGO827 (SOT115T)			
1	monitor current		
2, 3	common		
4	+V_B of the photodiode		
5	+V_B of the amplifier		
7, 8	common		
9	output		
BGO827/FC0 (SOT115X)			
1	monitor current		
2, 3	common		
4	+V_B of the photodiode		
5	+V_B of the amplifier		
7, 8	common		
9	output		
BGO827/SC0 (SOT115Y)			
1	monitor current		
2, 3	common		
4	+V_B of the photodiode		
5	+V_B of the amplifier		
7, 8	common		
9	output		

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3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BGO827	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; optical input; 8 gold-plated in-line leads	SOT115T
BGO827/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
BGO827/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 range		40	870	MHz
T_{stg}	storage temperature		–40	+85	°C
T_{mb}	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

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	responsivity					
	BGO827	λ = 1300 nm	800	-	-	V/W
	BGO827/FC0; BGO827/SC0		750	-	-	V/W
ΔS	responsivity difference	responsivity at T_{mb} = 85 °C – responsivity at T_{mb} = 30 °C; f = 870 MHz	-	–50	-	V/W
FL	flatness straight line (peak to valley)	f = 40 MHz to 870 MHz	-	-	1	dB
SL	slope straight line	f = 40 MHz 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 MHz to 870 MHz	11	-	-	dB
	optical input return losses		45	-	-	dB

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Table 5. Characteristics *...continued*

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
d_2	second order distortion	f_m = 446.5 MHz	[1][2]	-	-	−68	dB
		f_m = 746.5 MHz	[1][3]	-	-	−63	dB
		f_m = 854.5 MHz	[1][4]	-	-	−57	dB
Δd2	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
d_3	third order distortion	f_m = 853.25 MHz	[5][6]	-	-	−73	dB
Δd3	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 noise input	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 ±20 nm		0.85	-	-	A/W
		λ = 1550 ±20 nm		0.9	-	-	A/W
λ	optical wavelength			1290	-	1600	nm
L	length of optical fiber	SM type; 9/125 μm					
	BGO827			1	-	-	m
	BGO827/FC0; BGO827/SC0			746	-	861	mm
I_{tot}	total current consumption (DC)			175	-	205	mA
I_{bias}	diode bias current at pin 4 (DC)			-	-	25	mA

[1] Two laser test; each laser with a modulation index of 40 %; P_{opt} = 1 mW (total)

[2] f_m = 446.5 MHz; f_p = 97.25 MHz; f_q = 349.25 MHz

[3] f_m = 746.5 MHz; f_p = 133.25 MHz; f_q = 613.25 MHz

[4] f_m = 854.5 MHz; f_p = 133.25 MHz; f_q = 721.25 MHz

[5] Three laser test; each laser with a modulation index of 60 %; P_{opt} = 1 mW (total)

[6] f_m = 853.25 MHz; f_p = 133.25 MHz; f_q = 265.25 MHz; f_r = 721.25 MHz

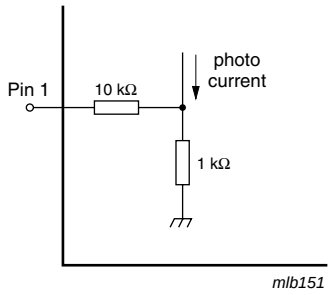


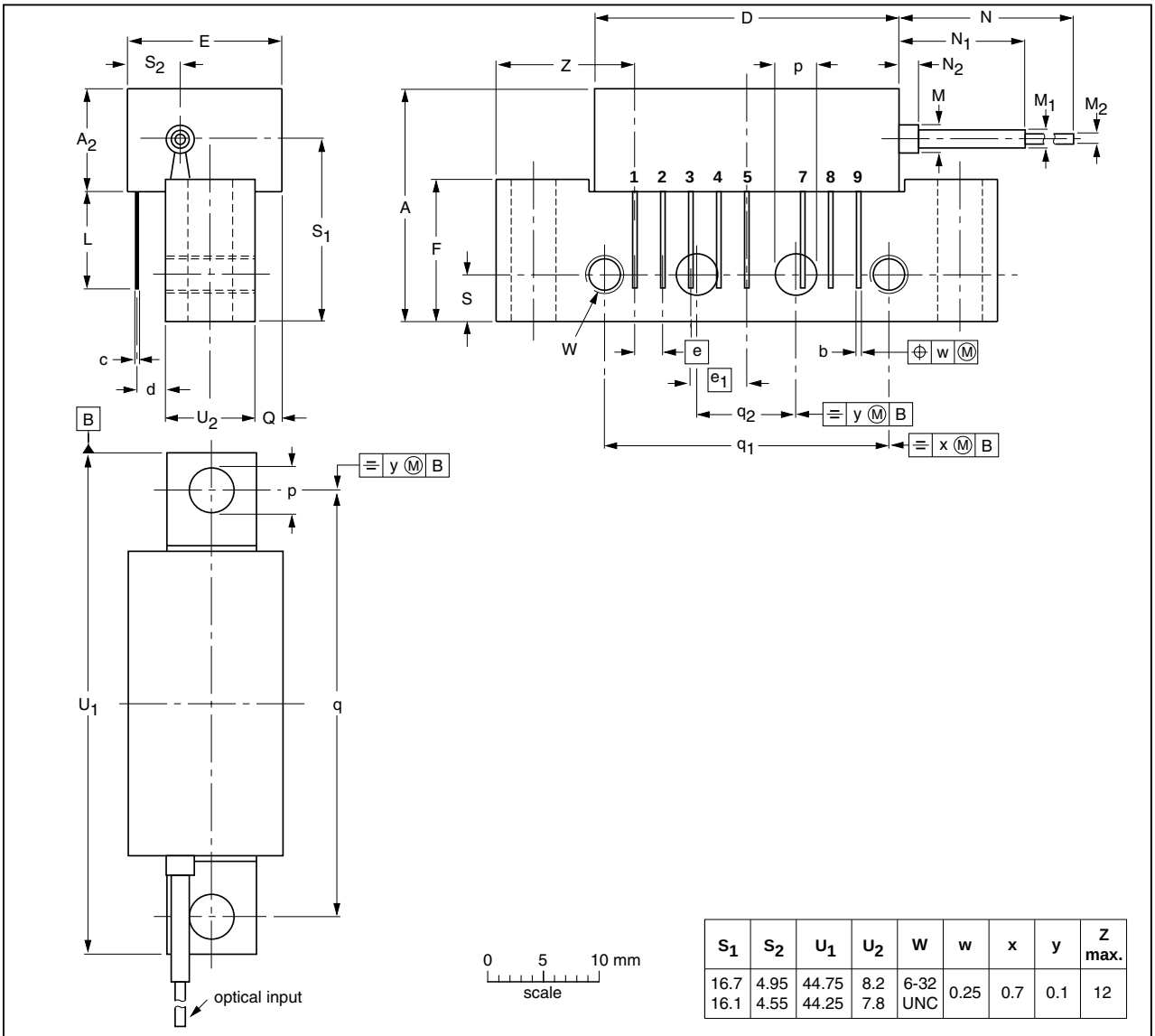
Fig 1. Monitor current pin

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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; 8 gold-plated in-line leads **SOT115T**



S_1	S_2	U_1	U_2	W	w	x	y	Z max.
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 min.	N_1	N_2	p	Q max.	q	q_1	q_2	S
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	1000	10.7 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	4.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115T						~~04-02-04~~ 10-06-18

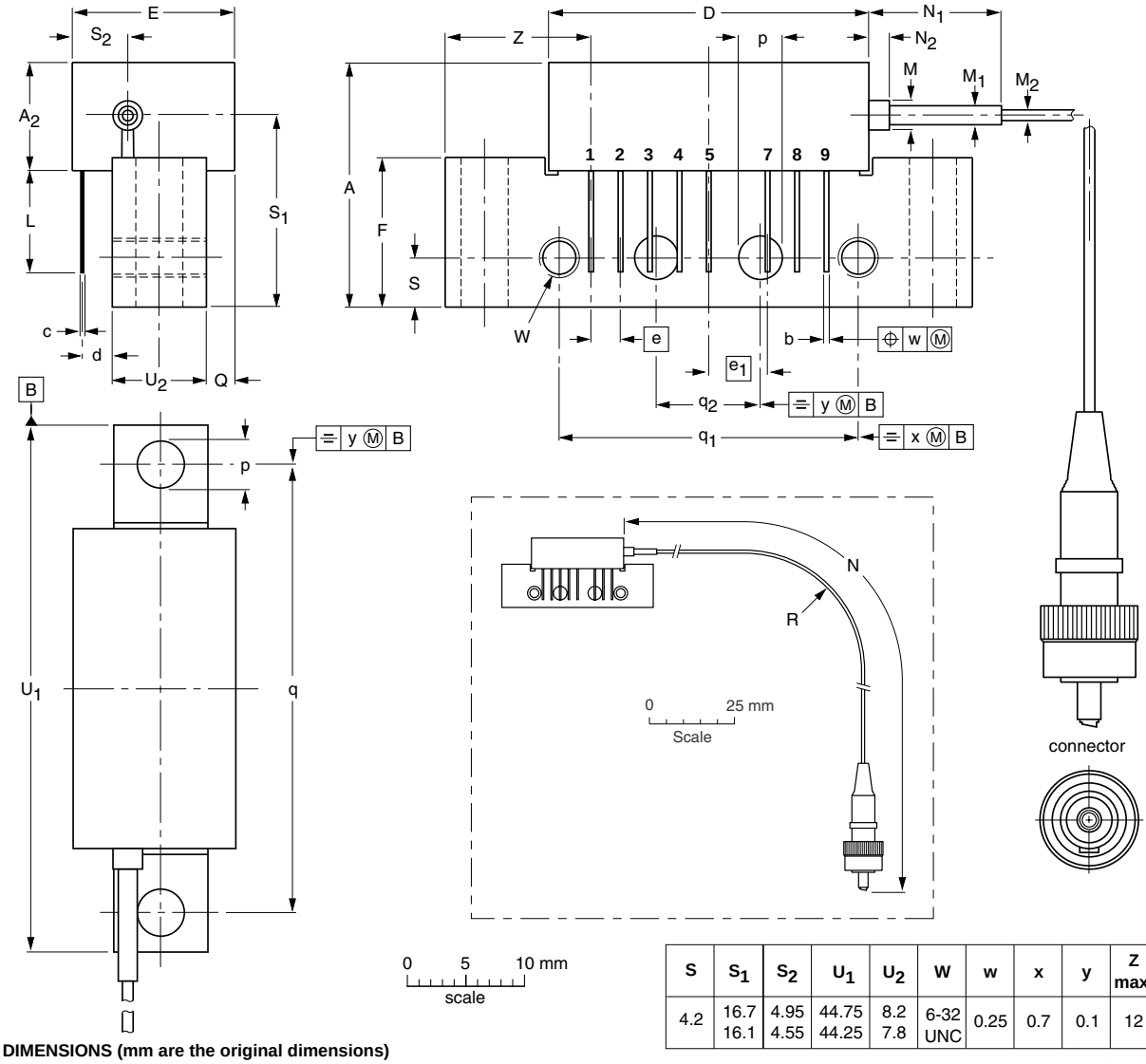
Fig 2. Package outline SOT115T

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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
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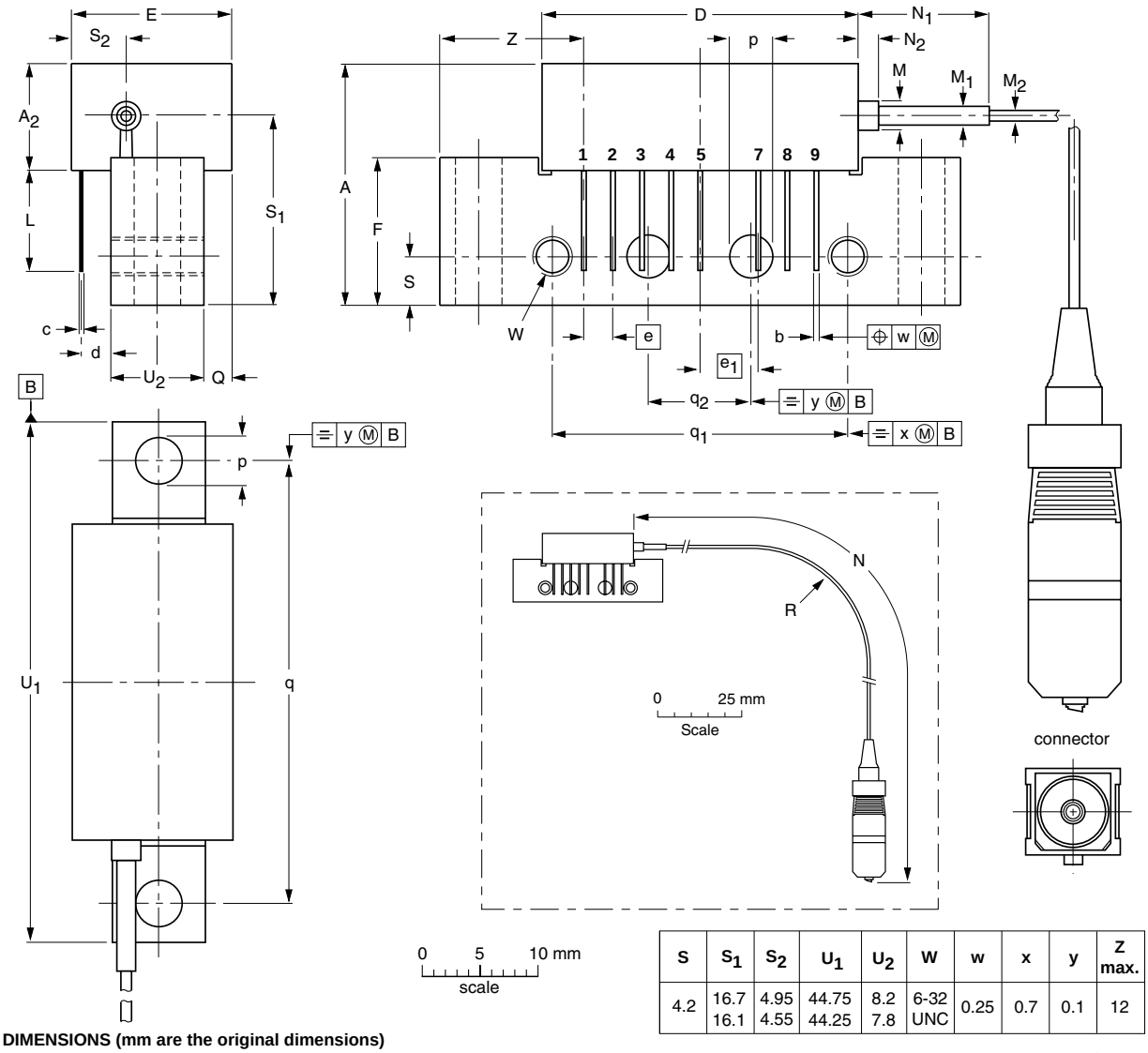
Fig 3. Package outline SOT115X

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Rectangular single-ended package; aluminium flange;
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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 4. Package outline SOT115Y

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7. Handling information

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

8. Revision history

Table 6. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BGO827_FC0_SC0 v.5	20100929	Product data sheet	-	BGO827_FC0_SC0 v.4
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Package outline and simplified outline drawings have been updated to the latest version.			
BGO827_FC0_SC0 v.4 (9397 750 14436)	20050329	Product data sheet	-	BGO827_FC0_SC0 v.3
BGO827_FC0_SC0 v.3 (9397 750 13061)	20040407	Product specification	-	BGO827_FC0_SC0 v.2
BGO827_FC0_SC0 v.2 (9397 750 10522)	20021210	Product specification	-	BGO827_FC0_SC0 v.1
BGO827_FC0_SC0 v.1 (9397 750 09934)	20020627	Product specification	-	-

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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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