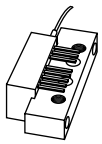


BGO827; BGO827/FC0; BGO827/SC0

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.

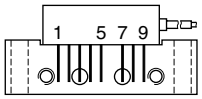
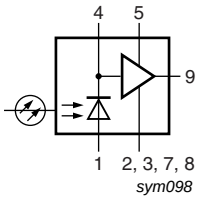
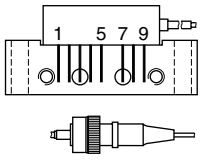
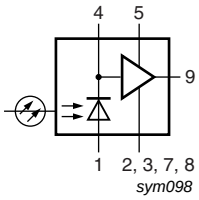
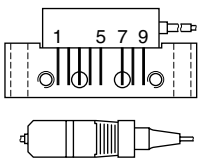
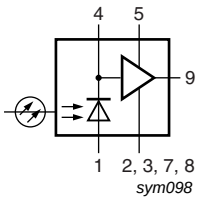
1.4 Quick reference data

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		

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

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

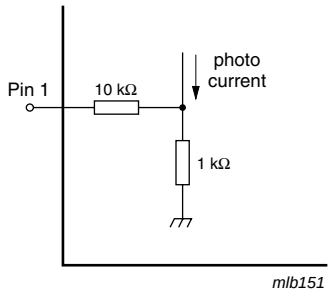
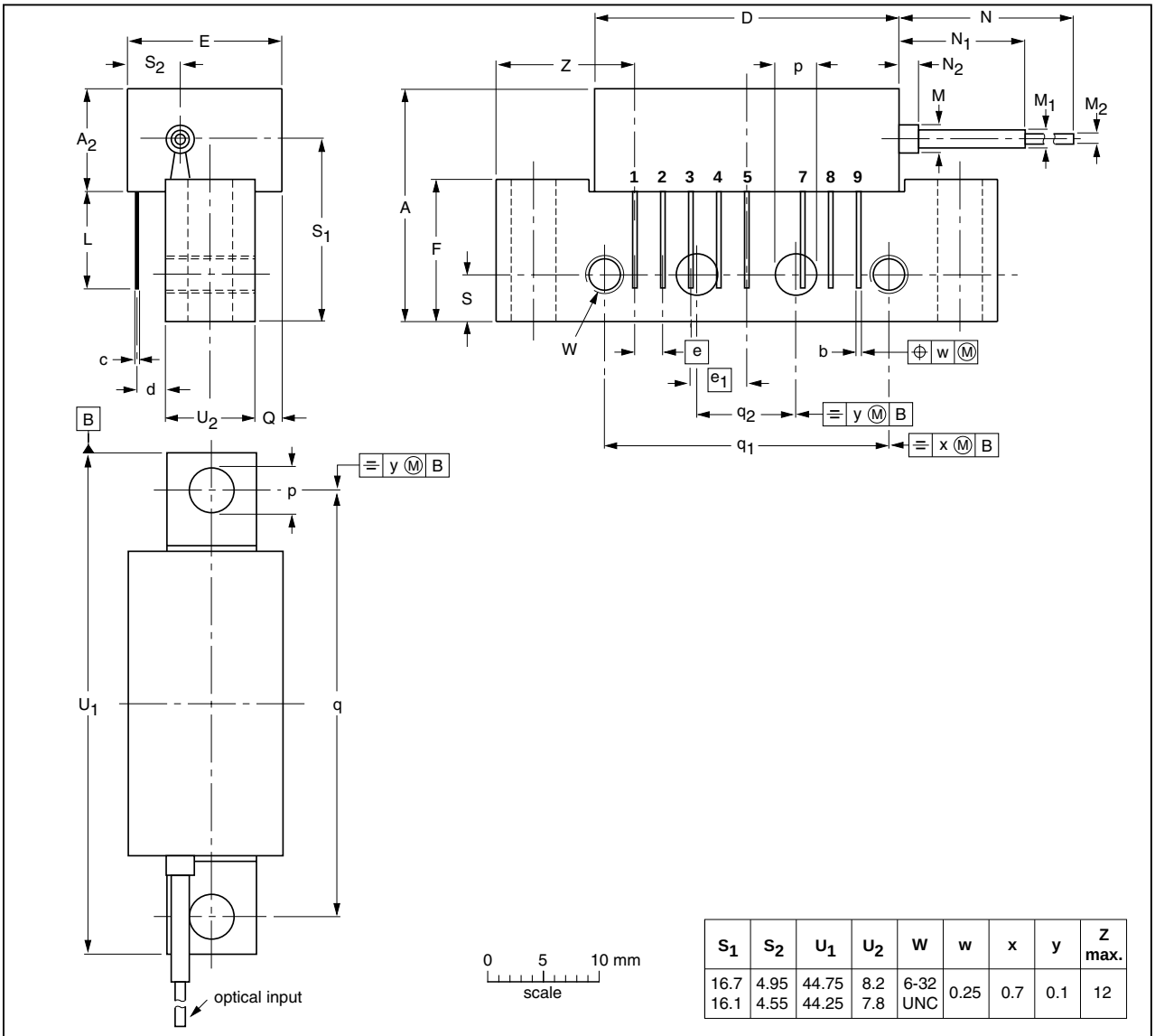


Fig 1. Monitor current pin

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)

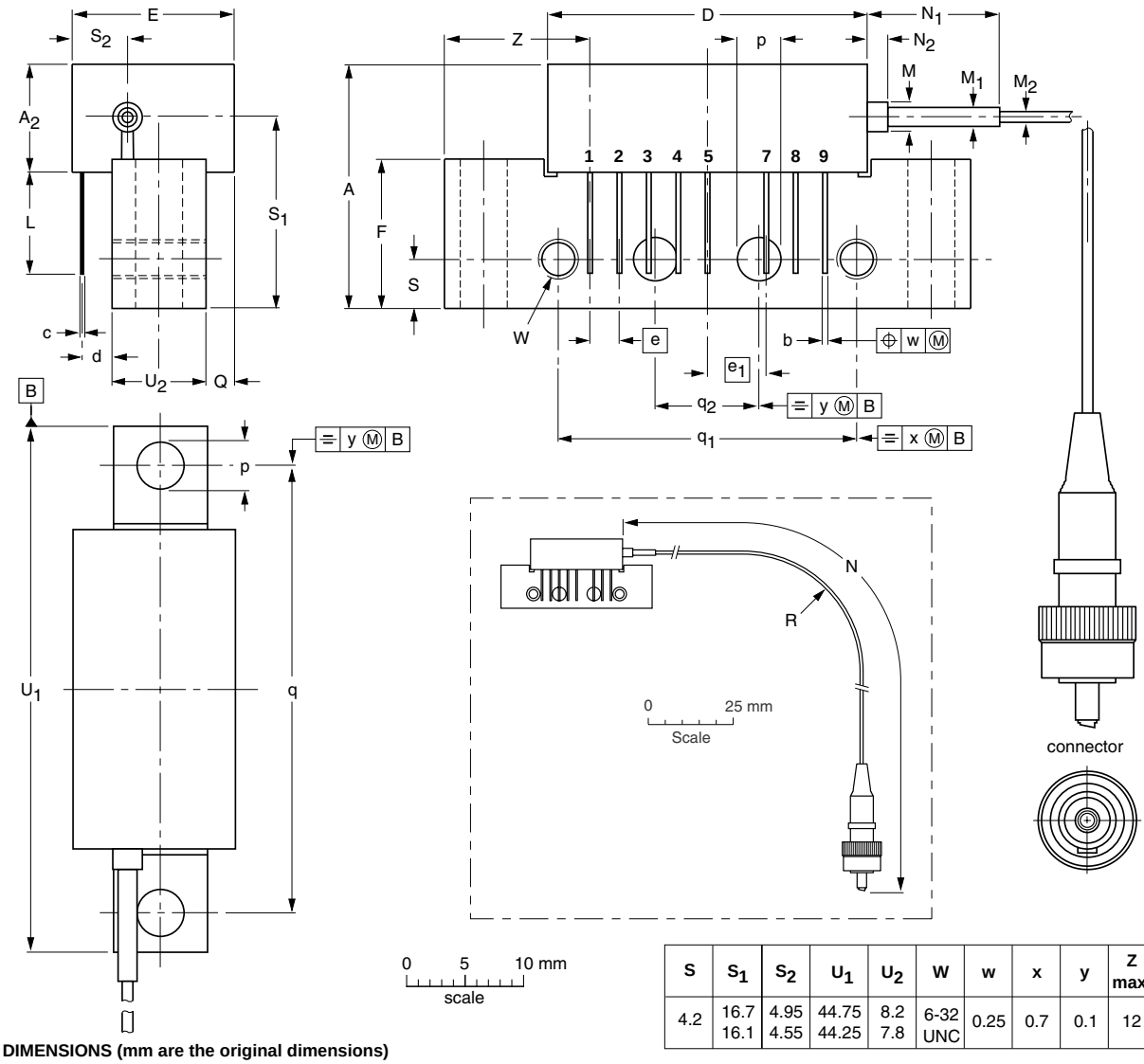
UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N min.	N_1	N_2	p	Q max.	q	q_1	q_2	S
mm	20.8	9.5	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	1000	10.7 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	4.2

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

Fig 2. Package outline SOT115T

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)

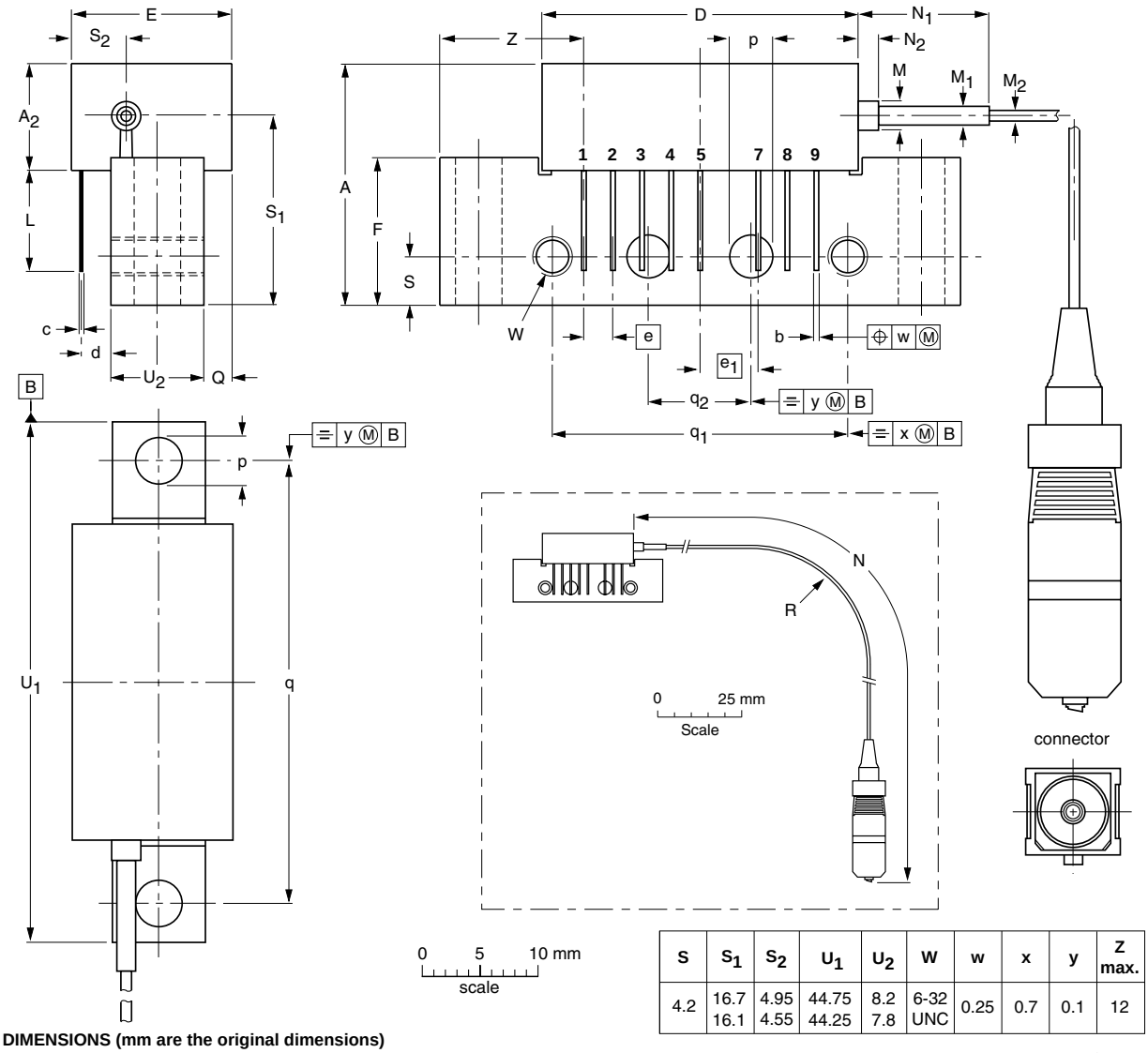
UNIT	A max.	A_2 max.	b	c	D max.	d max.	E max.	e	e_1	F	L min.	M	M_1	M_2	N	N_1	N_2	p	Q max.	q	q_1	q_2	R min.
mm	20.8	9.5	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	2.5	1.6	0.9	861 746	10.7 0.0	5 0	4.15 3.85	2.4	38.1	25.4	10.2	35

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

Fig 3. 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 4. Package outline SOT115Y

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	-	-

9. Legal information

9.1 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

9.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between NXP Semiconductors and its customer, unless NXP Semiconductors and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the NXP Semiconductors product is deemed to offer functions and qualities beyond those described in the Product data sheet.

9.3 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the *Terms and conditions of commercial sale* of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

9.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

10. Contact information

For more information, please visit: **http://www.nxp.com**

For sales office addresses, please send an email to: **salesaddresses@nxp.com**

11. Contents

For more information, please visit: http://www.nxp.com
For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 29 September 2010
Document identifier: BGO827_FC0_SC0

AMEYA360
Components Supply Platform

Authorized Distribution Brand :

Website :

Welcome to visit www.ameya360.com

Contact Us :

- ### Address :

  401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
  Minhang District, Shanghai , China

- ### Sales :

  Direct +86 (21) 6401-6692

  Email amall@ameya360.com

  QQ 800077892

  Skype ameyasales1 ameyasales2

- ### Customer Service :

  Email service@ameya360.com

- ### Partnership :

  Tel +86 (21) 64016692-8333

  Email mkt@ameya360.com