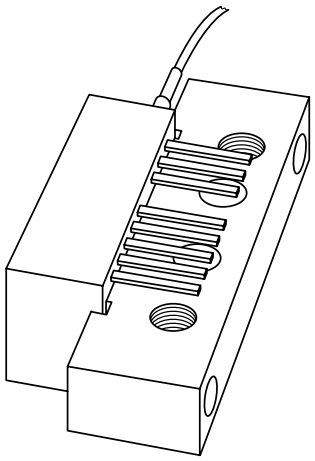
DATA SHEET



BGO827; BGO827/FC0; BGO827/SC0

870 MHz optical receivers

Product specification

2004 Apr 07

Supersedes data of 2002 Dec 10

Philips Semiconductors

PHILIPS

870 MHz optical receivers

BGO827; BGO827/FC0; BGO827/SC0

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 Ω.

PINNING

PIN	DESCRIPTION
1	monitor current
2	common
3	common
4	$+V_B$ of the photo diode
5	$+V_B$ of the amplifier
7	common
8	common
9	output

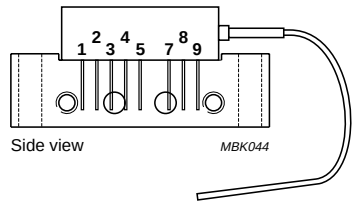


Fig.1 Simplified outline SOT115T (BGO827).

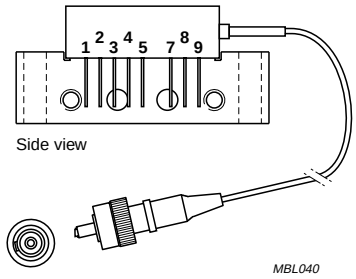


Fig.2 Simplified outline SOT115X (BGO827/FC0).

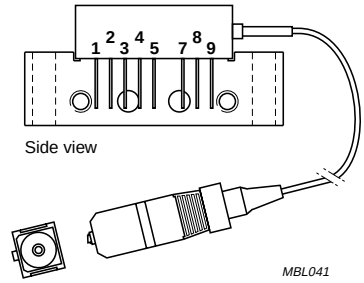


Fig.3 Simplified outline SOT115Y (BGO827/SC0).

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	870	MHz
s_{22}	output return losses	f = 40 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 to 870 MHz	–	8.5	pA/√Hz
I_{tot}	total current consumption (DC)	V_B = 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.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
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	SOT115T
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	SOT115X
BGO827/SC0	–	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

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_{stg}	storage temperature		–40	+85	°C
T_{mb}	operating 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

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
S	responsivity	λ = 1300 nm				
	BGO827		800	–	–	V/W
	BGO827/FC0, BGO827/SC0		750	–	–	V/W
ΔS	responsivity difference	resp at T_{mb} = 85 °C – resp at T_{mb} = 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
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 to 870 MHz	11	–	–	dB
	optical input return losses		45	–	–	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
d_2	second order distortion	f_m = 446.5 MHz; notes 1 and 3	–	–	–68	dB
		f_m = 746.5 MHz; notes 1 and 4	–	–	–63	dB
		f_m = 854.5 MHz; notes 1 and 5	–	–	–57	dB
Δd_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 °C – d_2 at T_{mb} = 30 °C	–	–1.5	–	dB
d_3	third order distortion	f_m = 853.25 MHz; notes 2 and 6	–	–	–73	dB
Δd_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 °C – d_3 at T_{mb} = 30 °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_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 fibre	fibre; 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

Notes

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

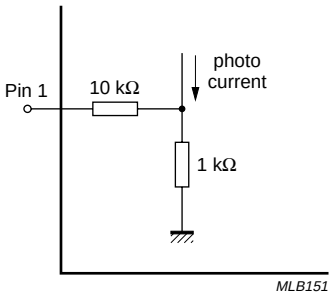
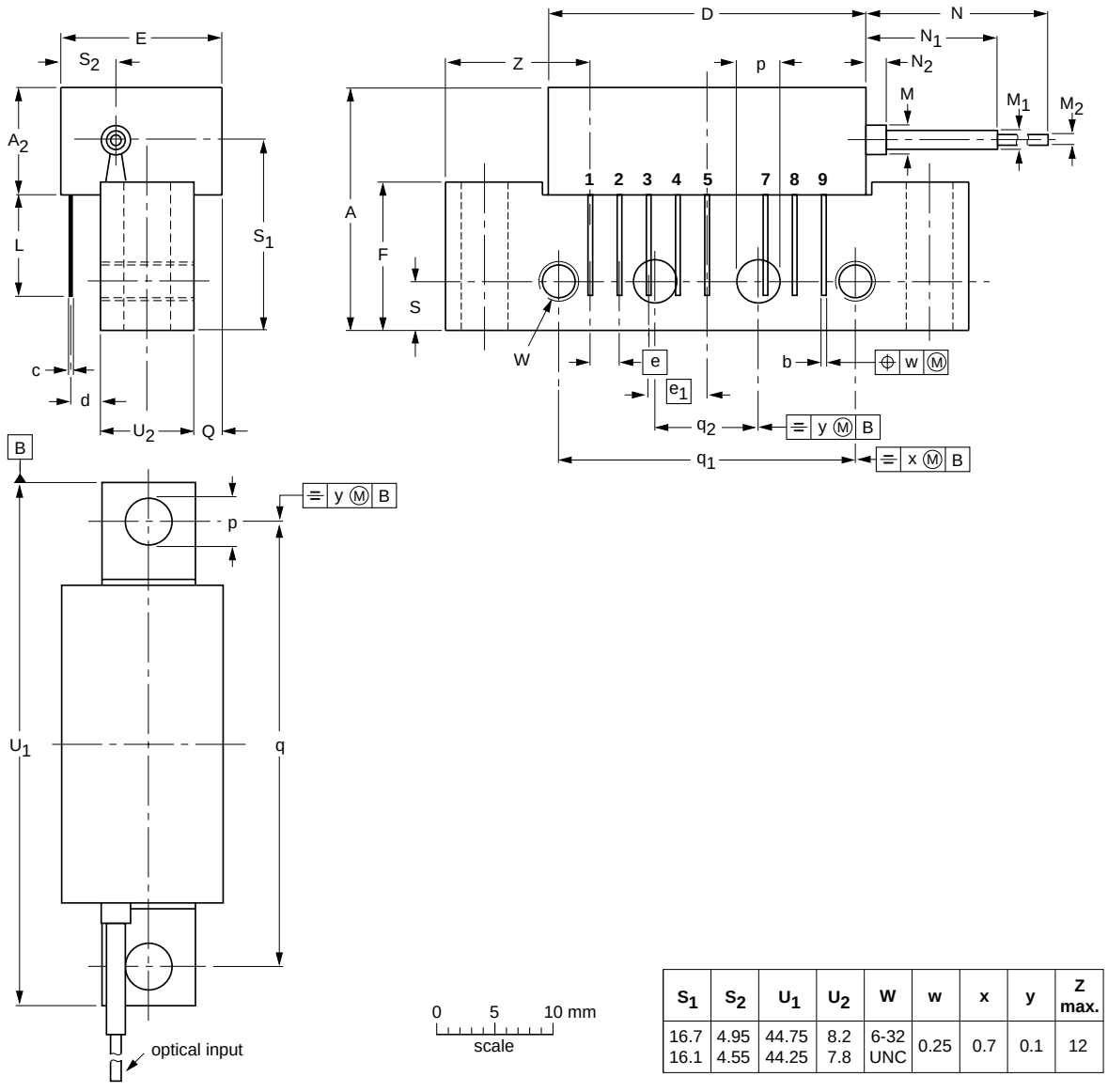


Fig.4 Monitor current pin.

PACKAGE OUTLINES

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**



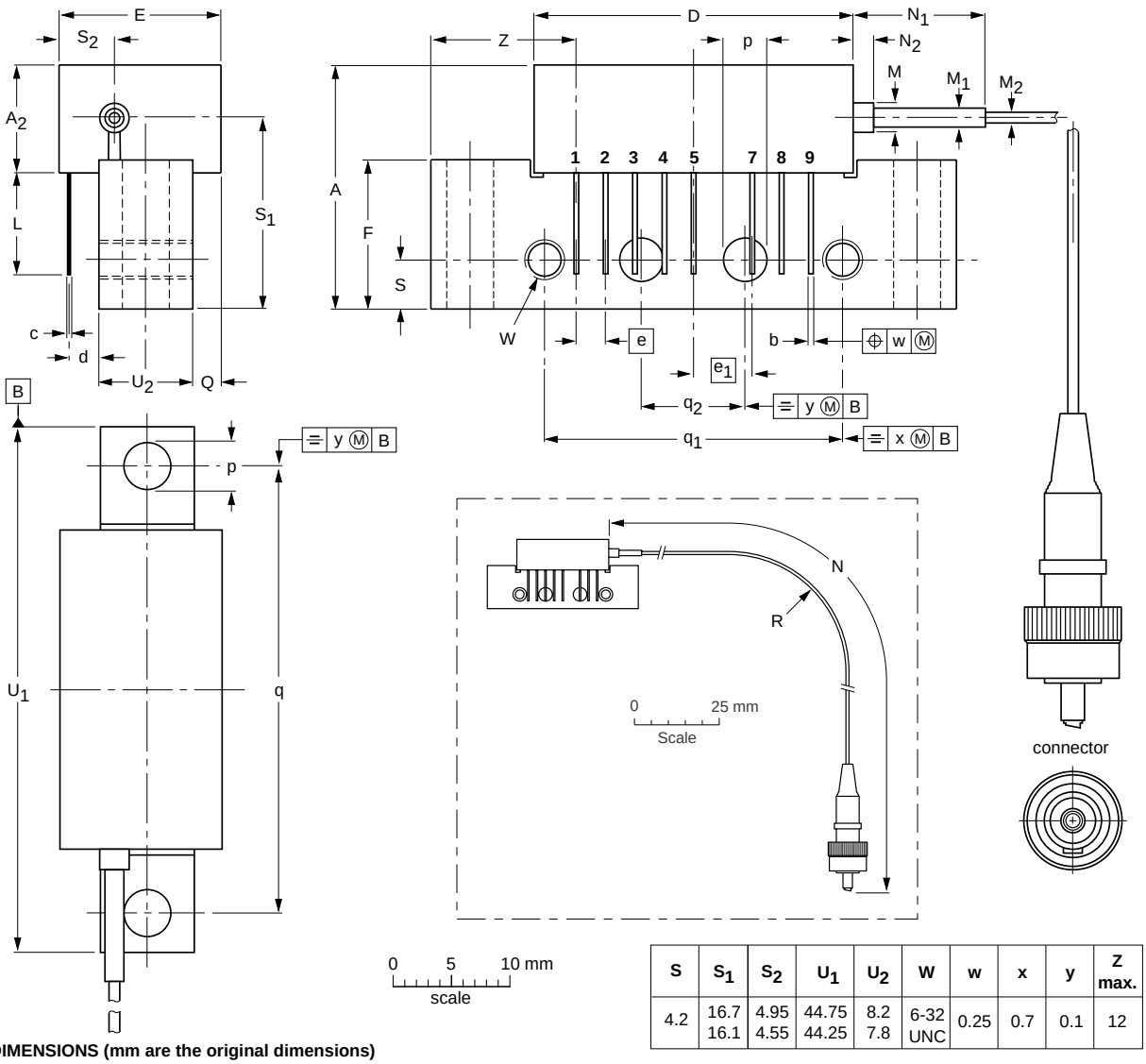
S_1	S_2	U_1	U_2	W	w	x	y	Z max.
16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

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	9.1	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						~~01-08-10~~ 04-02-04

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**



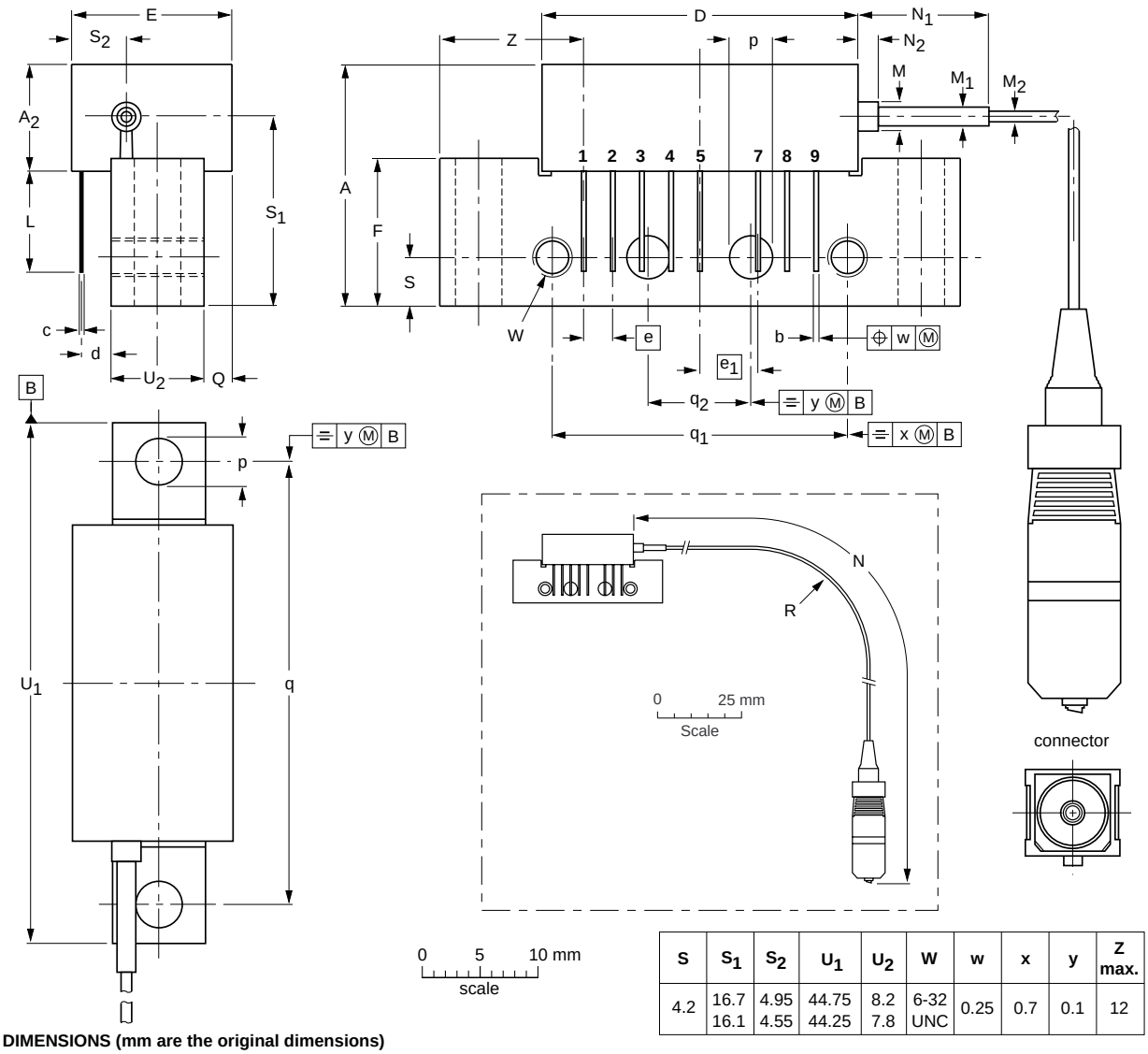
S	S_1	S_2	U_1	U_2	W	w	x	y	Z max.
4.2	16.7 16.1	4.95 4.55	44.75 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	12

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	9.1	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						~~01-08-10~~ 04-02-04

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	9.1	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						~~01-08-10~~ 04-02-05

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
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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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Contact information

For additional information please visit **http://www.semiconductors.philips.com**. Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

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