

DATA SHEET



BC868

**NPN medium power transistor;
20 V, 1 A**

Product specification
Data supersedes data of 1999 Apr 08

2003 Dec 02

NPN medium power transistor; 20 V, 1 A

BC868

FEATURES

- High current
- Two current gain selections
- 1.2 W total power dissipation.

APPLICATIONS

- Linear voltage regulators
- Low side switch
- Supply line switch for negative voltages
- MOSFET driver
- Audio (pre-) amplifier.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–	20	V
I_C	collector current (DC)	–	1	A
I_{CM}	peak collector current	–	2	A
h_{FE}	DC current gain			
	BC869	85	375	–
	BC869-25	100	375	–

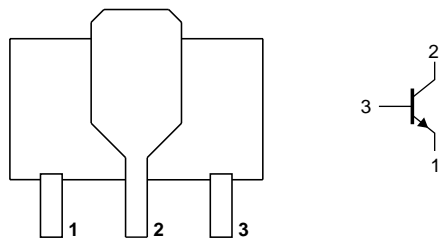
DESCRIPTION

NPN medium power transistor (see “Simplified outline, symbol and pinning” for package details).

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE
	PHILIPS	EIAJ	
BC868	SOT89	SC-62	CAC
BC868-25	SOT89	SC-62	CDC

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
BC868	 <p>Bottom view</p> <p>MAM296</p>	1	emitter
		2	collector
		3	base

RELATED PRODUCTS

TYPE NUMBER	DESCRIPTION	FEATURES
BC869	PNP medium power transistor	PNP complement
BCP68	NPN medium power transistor	SOT223, 20 V
B3P68	NPN medium power transistor	SOT54, 20 V

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ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC868	–	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89
BC868-25	–	plastic surface mounted package; collector pad for good heat transfer; 3 leads	SOT89

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

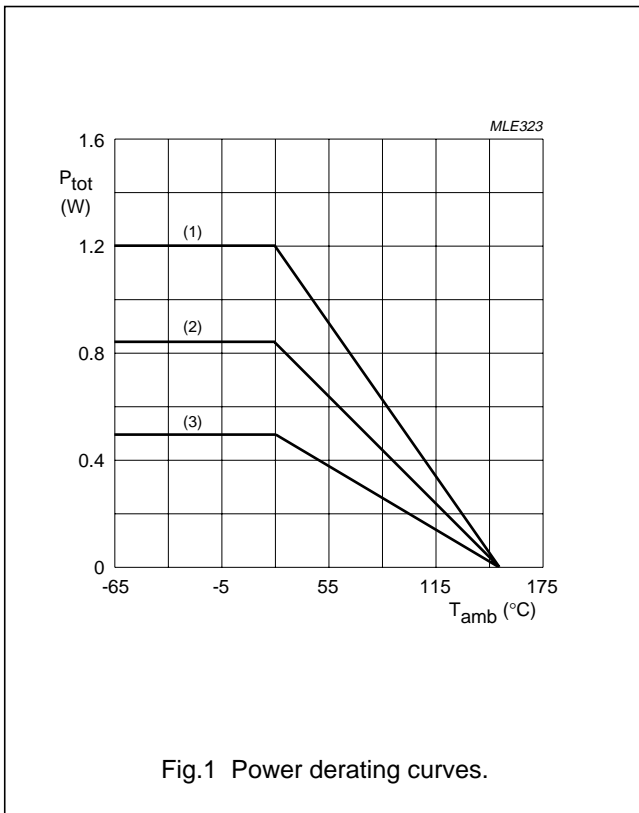
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage	open emitter	–	32	V
V _{CEO}	collector-emitter voltage	open base	–	20	V
V _{EBO}	emitter-base voltage	open collector	–	5	V
I _C	output current (DC)		–	1	mA
I _{CM}	peak collector current		–	2	mA
I _{BM}	peak collector current		–	200	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C			
		notes 1 and 2	–	0.5	W
		notes 1 and 3	–	0.85	W
		notes 1 and 4	–	1.2	W
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Refer to SOT89 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated footprint.
3. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
4. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².

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THERMAL CHARACTERISTICS

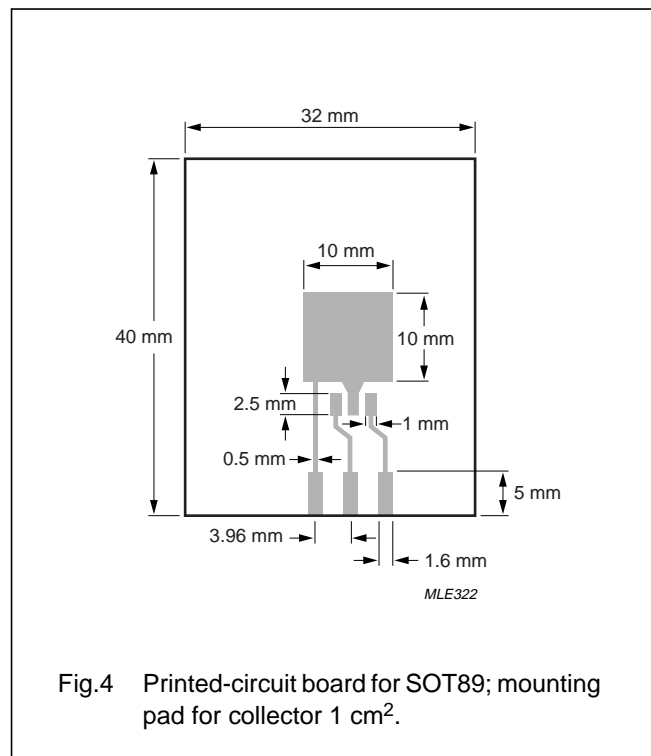
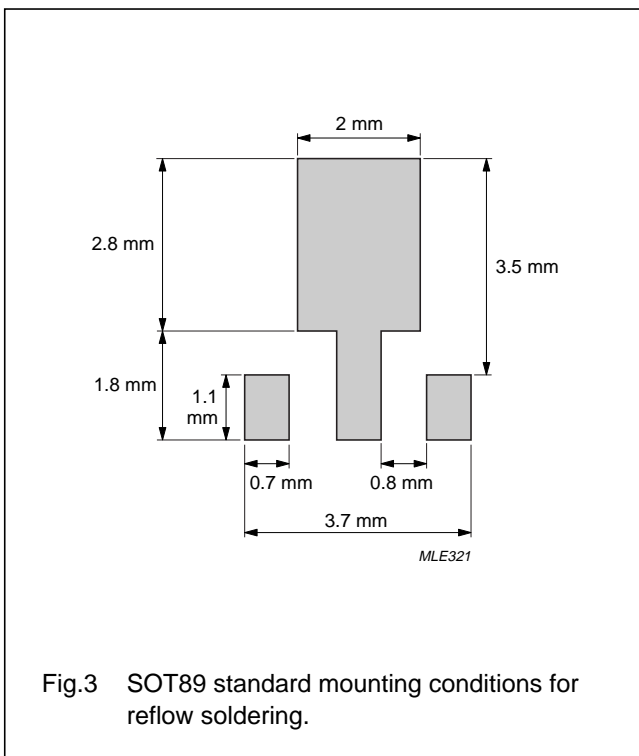
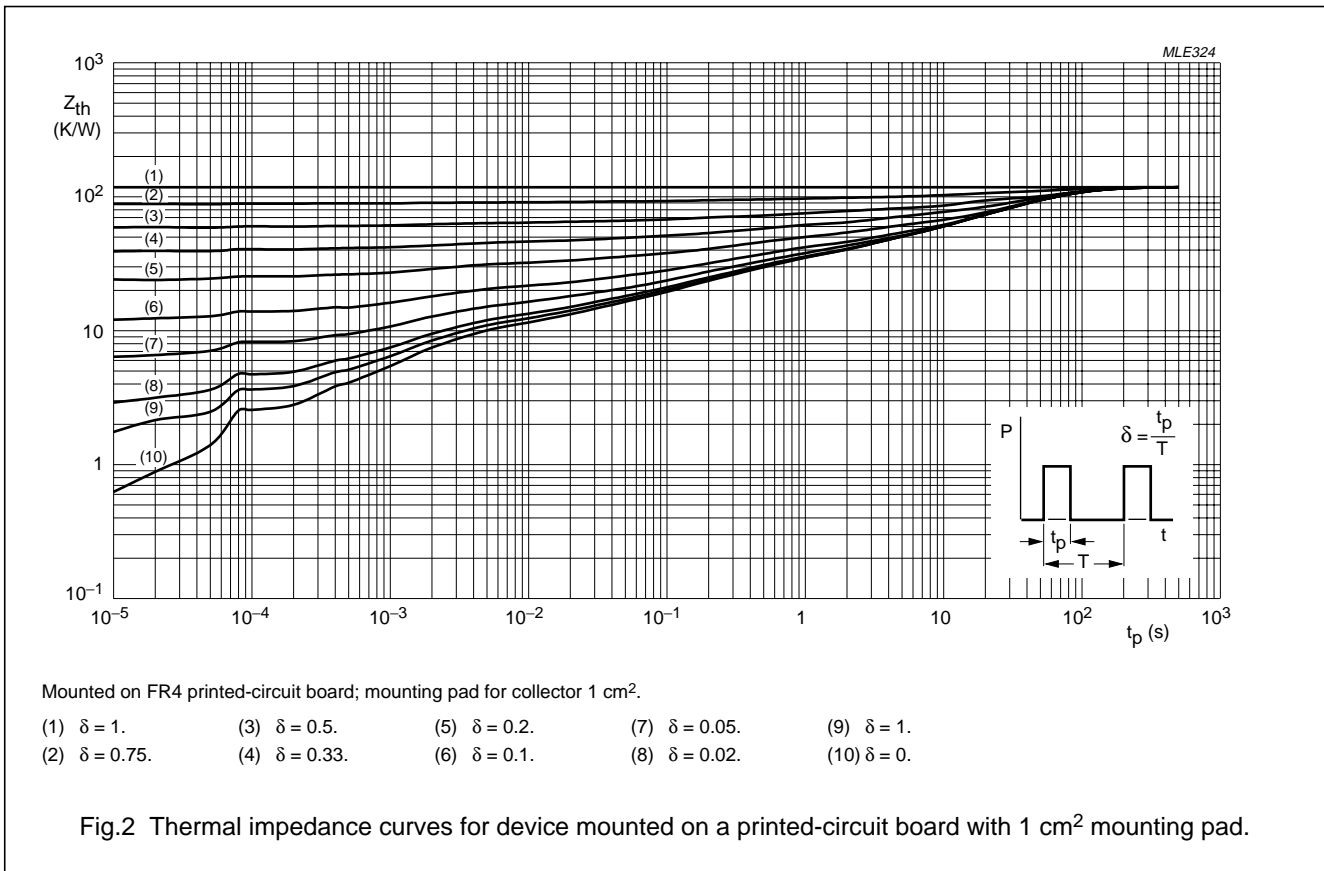
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C		
		notes 1 and 2	250	K/W
		notes 1 and 3	147	K/W
		notes 1 and 4	104	K/W
R _{th(j-s)}	thermal resistance from junction to solder point	T _{amb} ≤ 25 °C	20	K/W

Notes

1. Refer to SOT89 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated footprint.
3. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
4. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².

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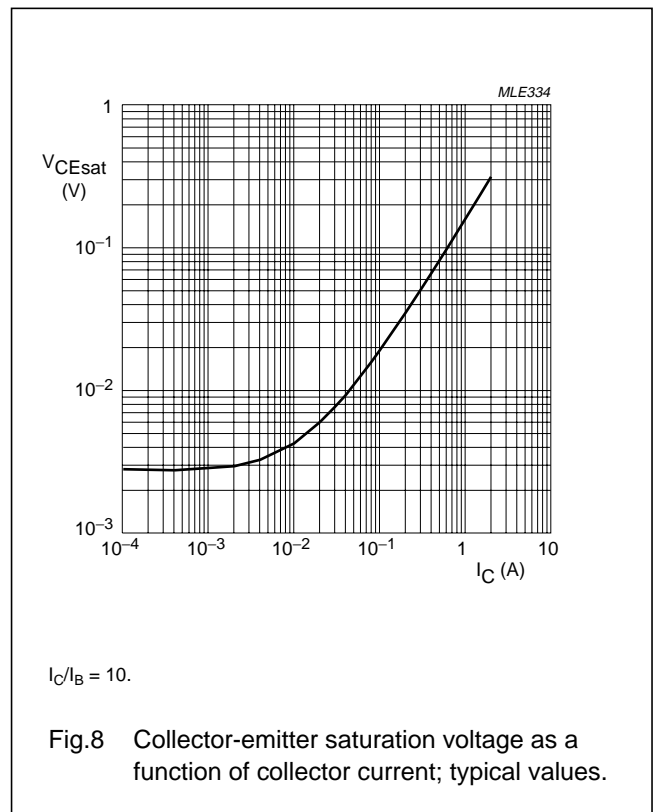
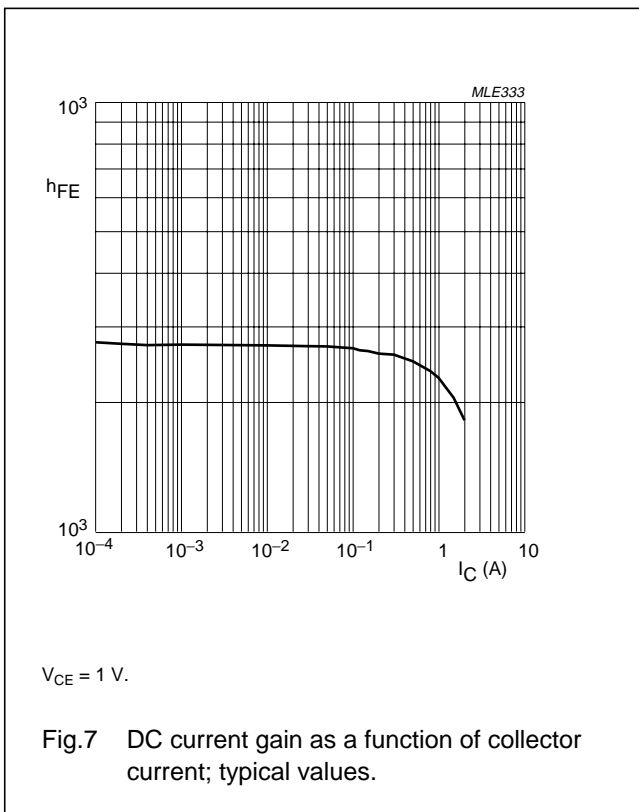
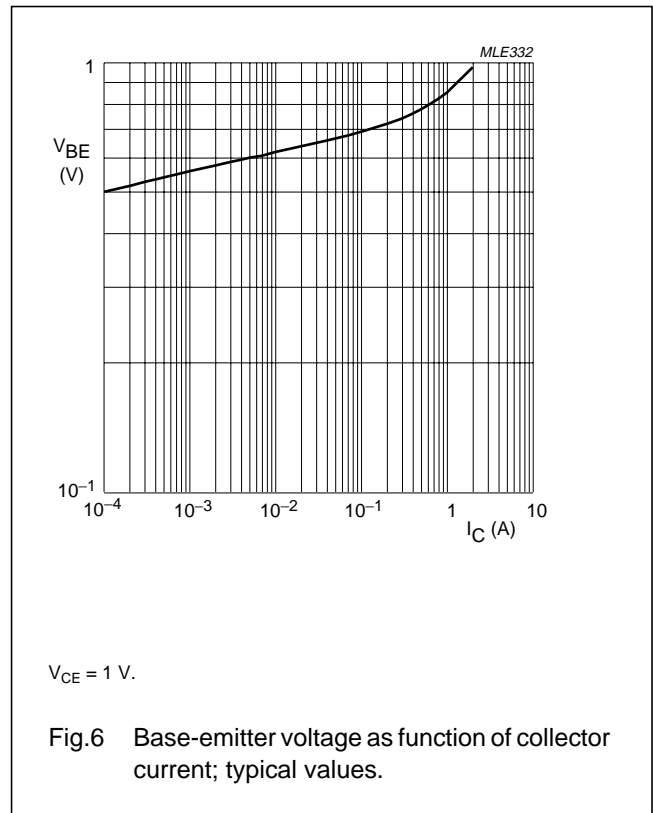
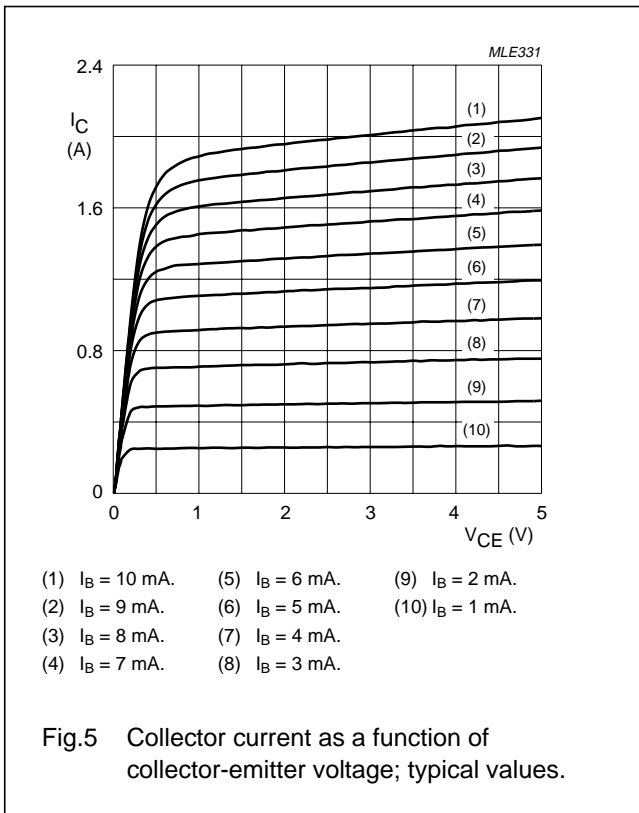
**NPN medium power transistor;
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BC868**CHARACTERISTICS** $T_{amb} = 25\text{ °C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 25\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 25\text{ V}; I_E = 0; T_J = 25\text{ °C}$	–	–	10	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
h_{FE}	DC current gain	BC868				
		$V_{CE} = 10\text{ V}; I_C = 5\text{ mA}$	50	–	–	
		$V_{CE} = 1\text{ V}; I_C = 500\text{ mA}$	85	–	375	
		$V_{CE} = 1\text{ V}; I_C = 1\text{ A}$	60	–	–	
h_{FE}	DC current gain	BC868-25				
		$V_{CE} = 1\text{ V}; I_C = 500\text{ mA}$	160	–	375	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 1\text{ A}; I_B = 100\text{ mA}$	–	–	500	mV
V_{BE}	base-emitter voltage	$V_{CE} = 10\text{ V}; I_C = 5\text{ mA}$	–	–	700	mV
		$V_{CE} = 1\text{ V}; I_C = 1\text{ A}$	–	–	1	V
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	–	22	–	pF
f_T	transition frequency	$V_{CE} = 5\text{ V}; I_C = 50\text{ mA};$ $f = 100\text{ MHz}$	40	170	–	MHz

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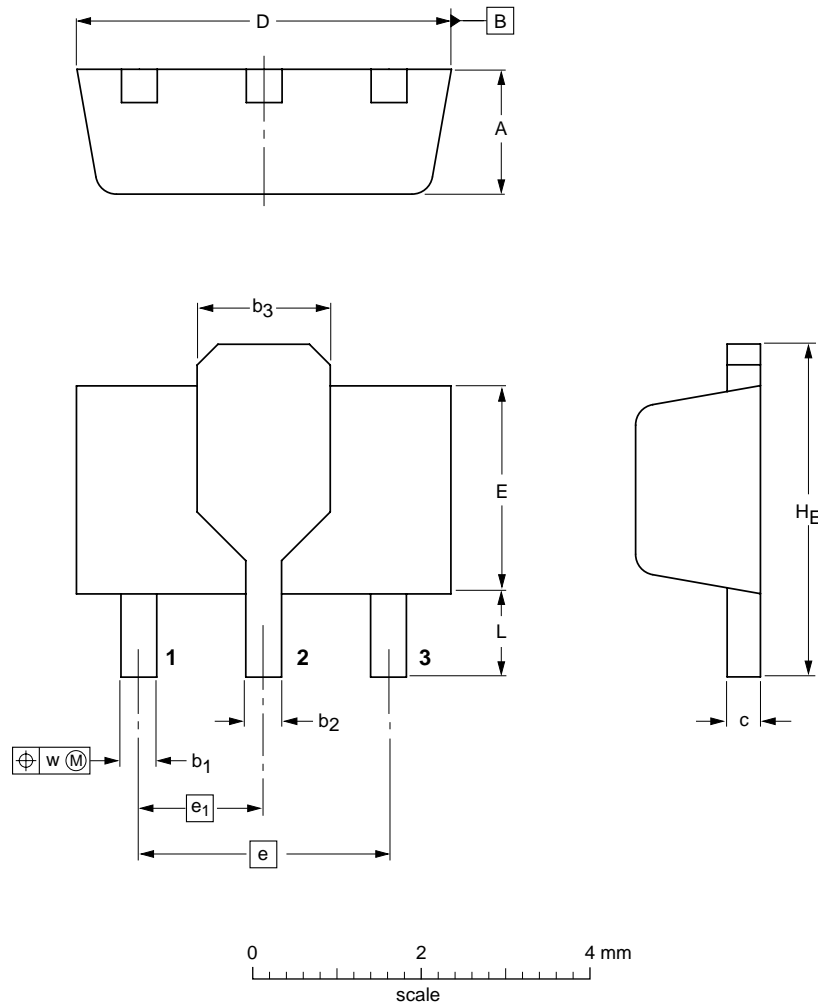
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b ₁	b ₂	b ₃	c	D	E	e	e ₁	H _E	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT89		TO-243	SC-62		97-02-28 99-09-13

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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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Notes

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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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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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