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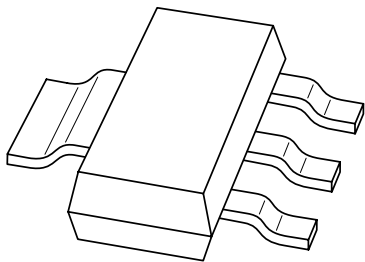
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Kind regards,

Team Nexperia

DATA SHEET



BSP89

**N-channel enhancement mode
vertical D-MOS transistor**

Product specification
Supersedes data of 1997 Jun 23

2001 May 18

N-channel enhancement mode vertical D-MOS transistor

BSP89

FEATURES

- Direct interface to C-MOS, TTL, etc.
- High-speed switching
- No secondary breakdown.

DESCRIPTION

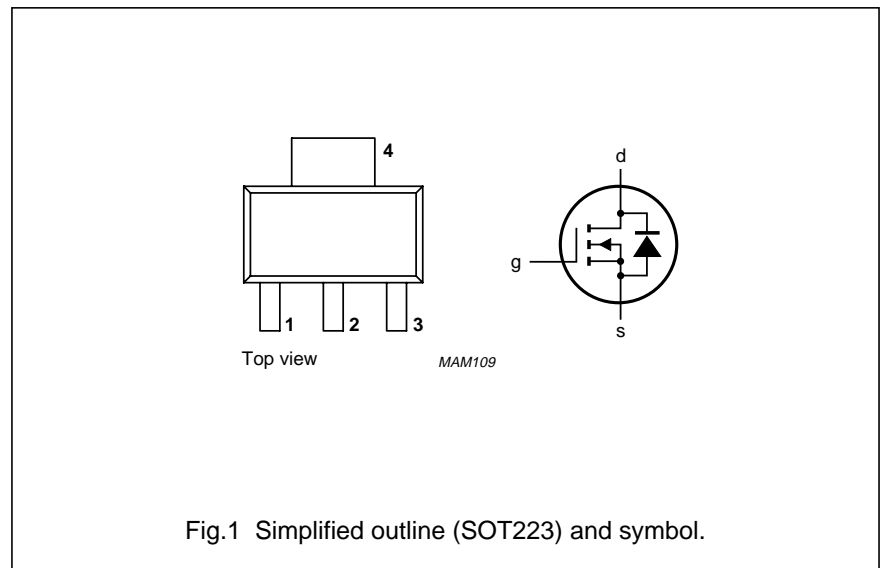
N-channel enhancement mode vertical D-MOS transistor in a SOT223 package, intended for use as a surface-mounted device in line current interrupters in telephone sets and for application in relay, high speed and line transformer drivers.

PINNING - SOT223

PIN	DESCRIPTION
Code: BSP89	
1	gate
2	drain
3	source
4	drain

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{DS}	drain-source voltage (DC)	240	V
V_{GSth}	gate-source threshold voltage	2	V
I_D	drain current (DC)	375	mA
R_{DSon}	drain-source on-state resistance	5	Ω



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	240	V
V_{GSO}	gate-source voltage (DC)	open drain	–	± 20	V
I_D	drain current (DC)		–	375	mA
I_{DM}	peak drain current		–	1.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$; note 1	–	1.5	W
T_{stg}	storage temperature		–55	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$

Note

1. Transistor mounted on an epoxy printed circuit board, 40 x 40 x 1.5 mm, mounting pad for the drain tab minimum 6 cm².

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient; note 1	83.3	K/W

Note

1. Transistor mounted on an epoxy printed circuit board, 40 x 40 x 1.5 mm, mounting pad for the drain tab minimum 6 cm².

CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 10\ \mu\text{A}; V_{GS} = 0$	240	–	–	V
I_{DSS}	drain-source leakage current	$V_{DS} = 60\ \text{V}; V_{GS} = 0$	–	–	200	nA
I_{GSS}	gate-source leakage current	$V_{GS} = \pm 20\ \text{V}; V_{DS} = 0$	–	–	100	nA
V_{GSth}	gate-source threshold voltage	$I_D = 1\ \text{mA}; V_{GS} = V_{DS}$	0.8	–	2	V
R_{DSon}	drain-source on-state resistance	$I_D = 340\ \text{mA}; V_{GS} = 10\ \text{V}$	–	2.8	5	Ω
		$I_D = 340\ \text{mA}; V_{GS} = 4.5\ \text{V}$	–	–	7.5	Ω
$ Y_{fs} $	transfer admittance	$I_D = 340\ \text{mA}; V_{DS} = 25\ \text{V}$	140	600	–	mS
C_{iss}	input capacitance	$V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$	–	100	120	pF
C_{oss}	output capacitance	$V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$	–	20	30	pF
C_{rss}	reverse transfer capacitance	$V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$	–	10	15	pF
Switching times (see Figs 3 and 4)						
t_{on}	turn-on time	$I_D = 250\ \text{mA}; V_{DD} = 50\ \text{V}; V_{GS} = 0\ \text{to}\ 10\ \text{V}$	–	6	10	ns
t_{off}	turn-off time	$I_D = 250\ \text{mA}; V_{DD} = 50\ \text{V}; V_{GS} = 0\ \text{to}\ 10\ \text{V}$	–	47	60	ns

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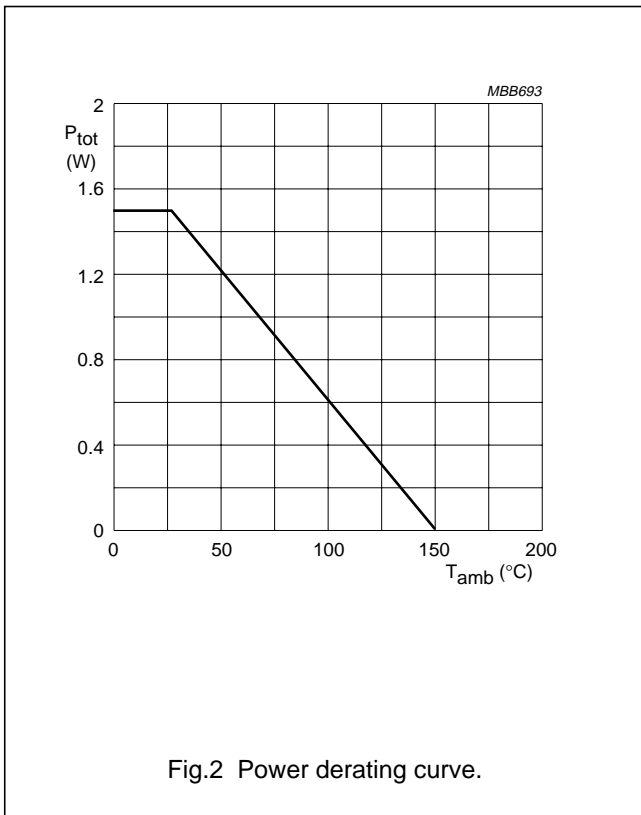


Fig.2 Power derating curve.

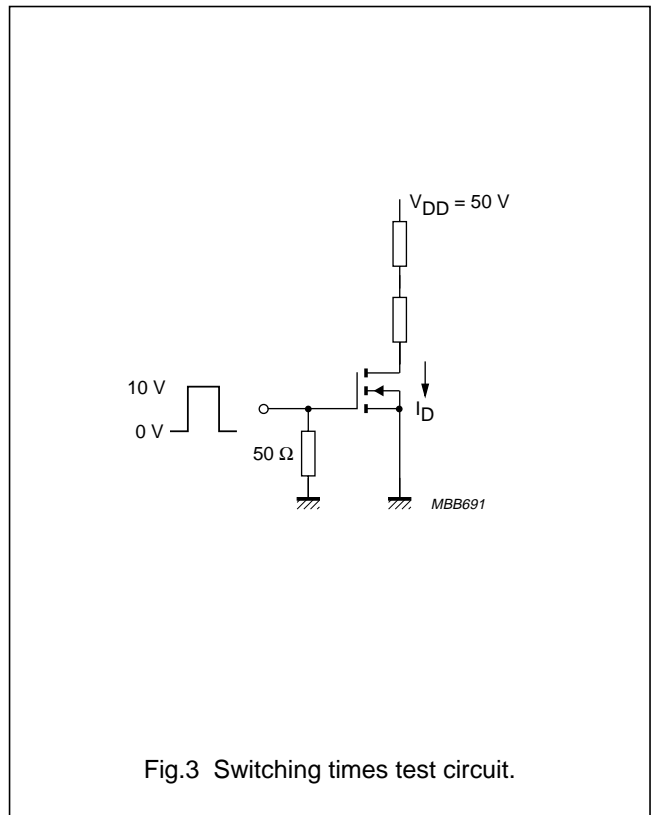


Fig.3 Switching times test circuit.

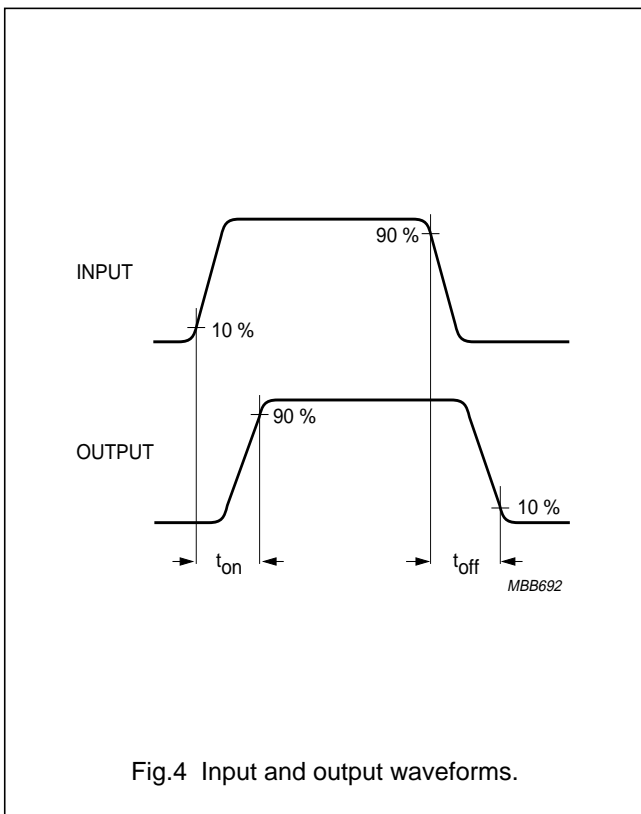


Fig.4 Input and output waveforms.

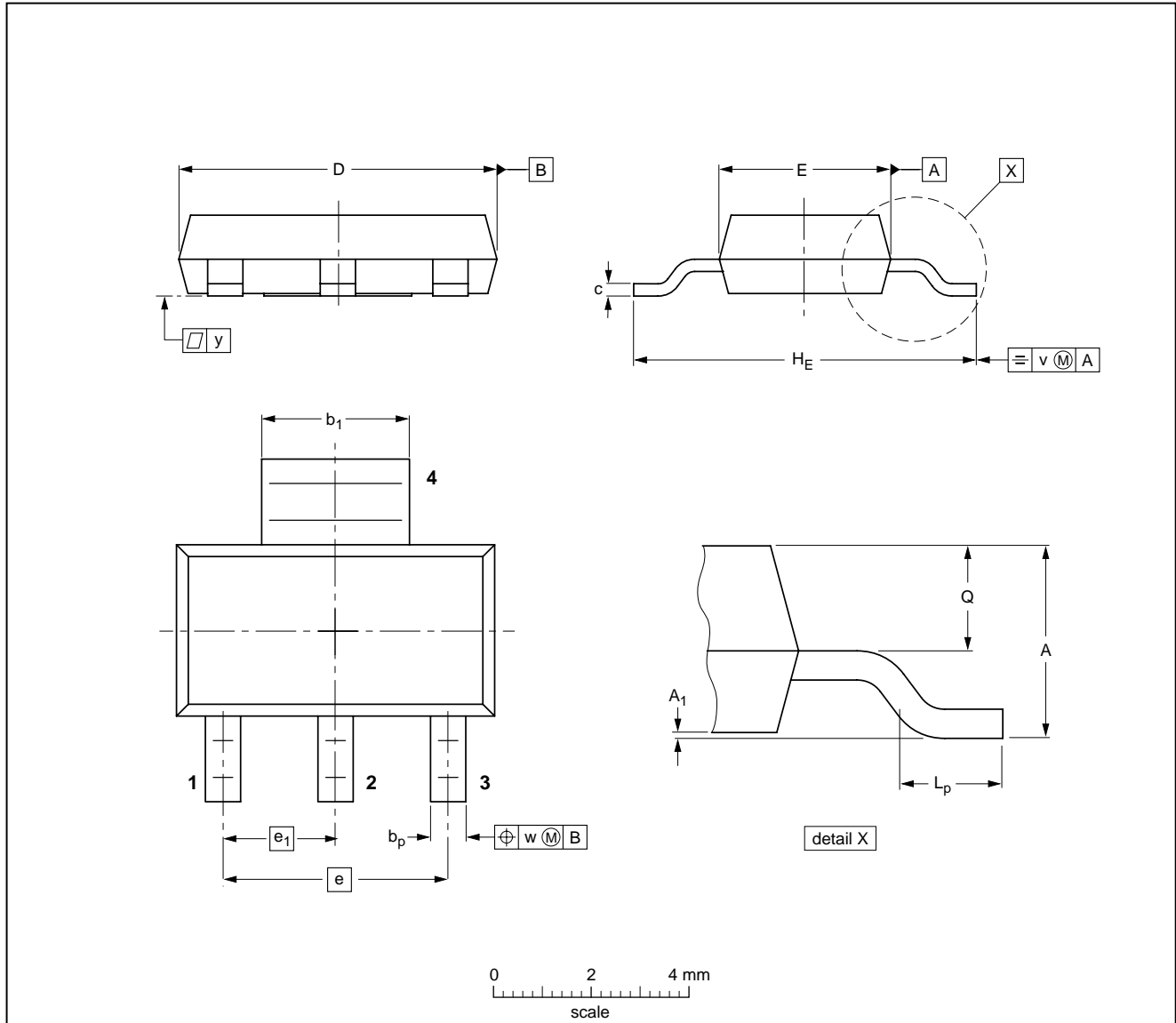
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b _p	b ₁	c	D	E	e	e ₁	H _E	L _p	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT223			SC-73		97-02-28 99-09-13

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DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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N-channel enhancement mode
vertical D-MOS transistor

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