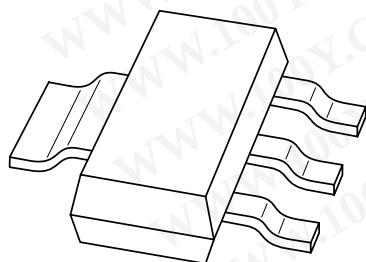


DATA SHEET

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BSP130

N-channel enhancement mode
vertical D-MOS transistor

Product specification
Supersedes data of 1997 Jun 23

2001 Dec 11

N-channel enhancement mode vertical D-MOS transistor

BSP130

FEATURES

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

APPLICATIONS

- Line current interruptor in telephone sets
- Relay, high-speed and line transformer drivers.

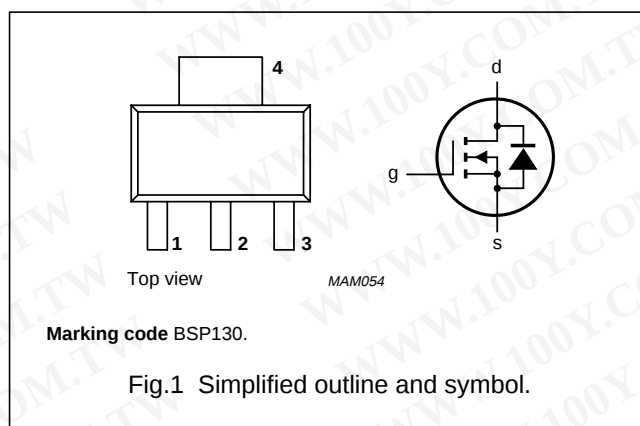
DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a SOT223 package.

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PINNING - SOT223

PIN	DESCRIPTION
1	gate
2	drain
3	source
4	drain



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	300	V
I_D	drain current (DC)		–	350	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$	–	1.5	W
V_{GSO}	gate-source voltage	open drain	–	± 20	V
$R_{DS(on)}$	drain-source on-state resistance	$I_D = 250\text{ mA}; V_{GS} = 10\text{ V}$	–	6	Ω
$V_{GS(off)}$	gate-source cut-off voltage	$I_D = 1\text{ mA}; V_{DS} = V_{GS}$	0.8	2	V

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	300	V
V_{GSO}	gate-source voltage (DC)	open drain	–	± 20	V
I_D	drain current (DC)		–	350	mA
I_{DM}	peak drain current		–	1.4	A
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}; \text{note 1}$	–	1.5	W
T_{stg}	storage temperature		–55	+150	$^\circ\text{C}$
T_j	junction temperature		–	150	$^\circ\text{C}$

Note

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

N-channel enhancement mode vertical D-MOS transistor

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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

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

STATIC 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	$I_D = 10\text{ }\mu\text{A}$; $V_{GS} = 0$	300	—	—	V
I_{GSS}	gate-source leakage current	$V_{GS} = \pm 20\text{ V}$; $V_{DS} = 0$	—	—	± 100	nA
V_{GSth}	gate-source threshold voltage	$I_D = 1\text{ mA}$; $V_{DS} = V_{GS}$	0.8	—	2	V
R_{DSon}	drain-source on-state resistance	$I_D = 20\text{ mA}$; $V_{GS} = 2.4\text{ V}$	—	4.8	10	Ω
		$I_D = 250\text{ mA}$; $V_{GS} = 10\text{ V}$	—	3.7	6	Ω
I_{DSS}	drain-source leakage current	$V_{DS} = 240\text{ V}$; $V_{GS} = 0$	—	—	100	nA
$ Y_{fs} $	transfer admittance	$I_D = 250\text{ mA}$; $V_{DS} = 25\text{ V}$	200	690	—	mS
C_{iss}	input capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	—	100	120	pF
C_{oss}	output capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	—	21	30	pF
C_{rss}	feedback capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	—	10	15	pF
Switching times (see Figs 2 and 3)						
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	$I_D = 250\text{ mA}$; $V_{DD} = 50\text{ V}$; $V_{GS} = 10\text{ to }0\text{ V}$	—	46	60	ns

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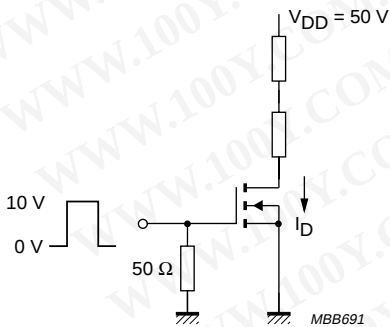


Fig.2 Switching times test circuit.

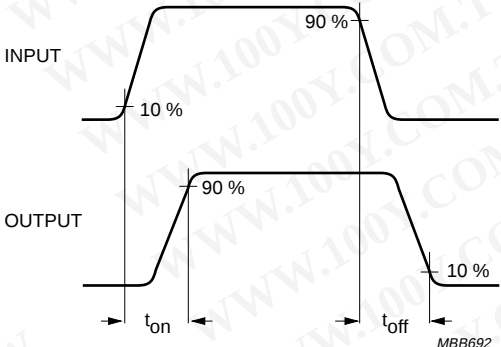


Fig.3 Input and output waveforms.

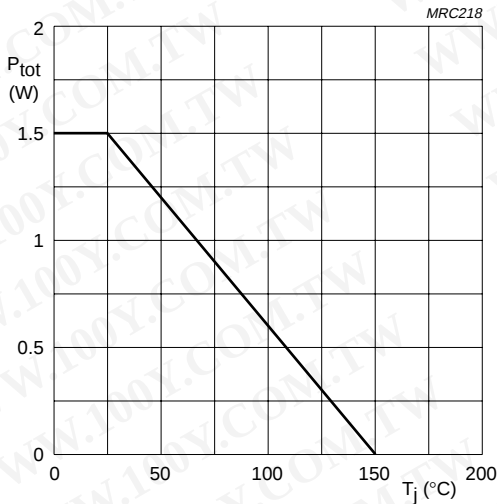
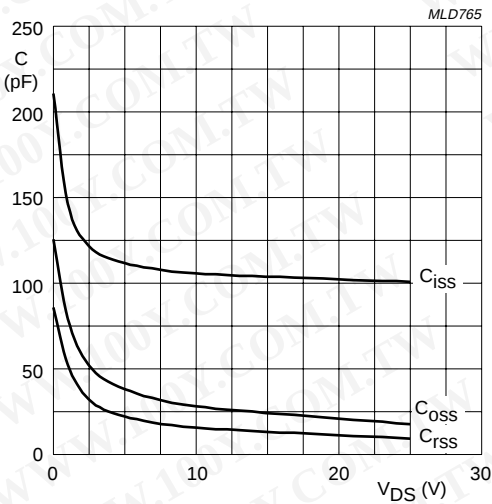


Fig.4 Power derating curve.



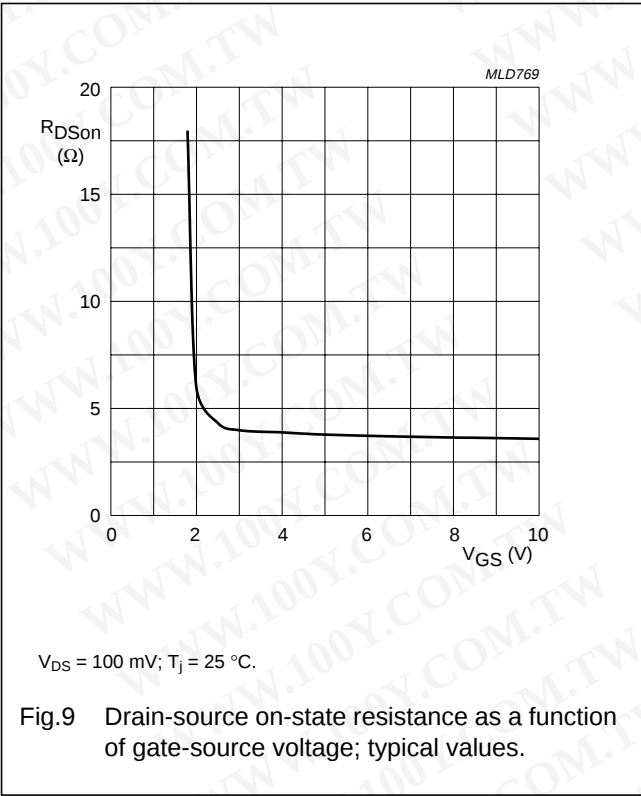
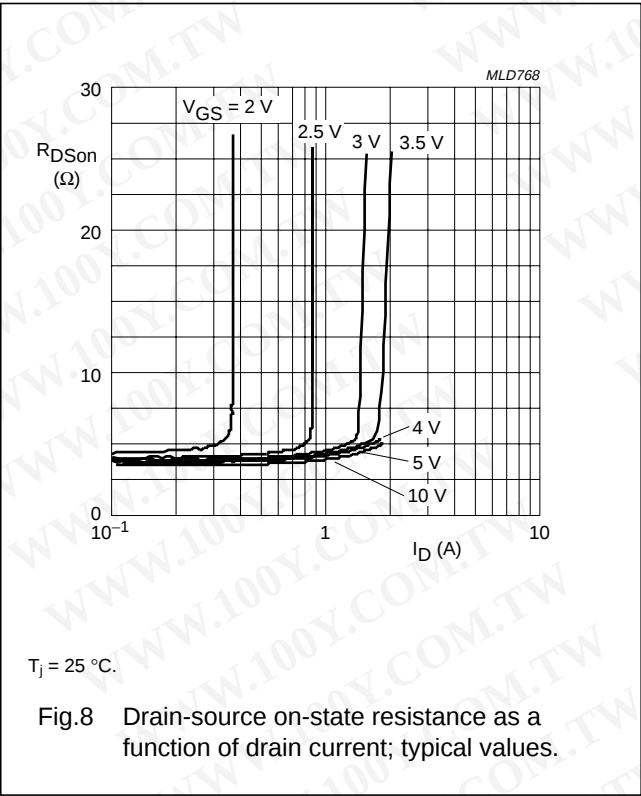
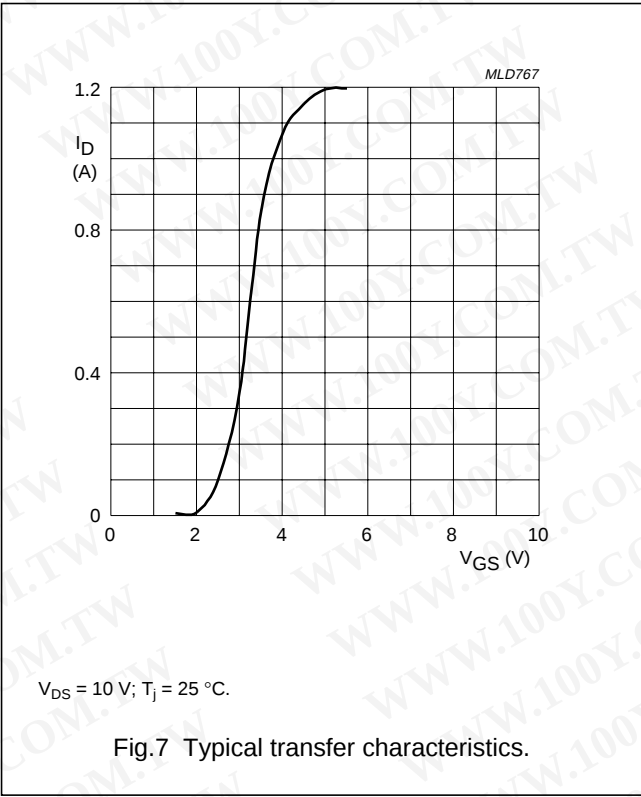
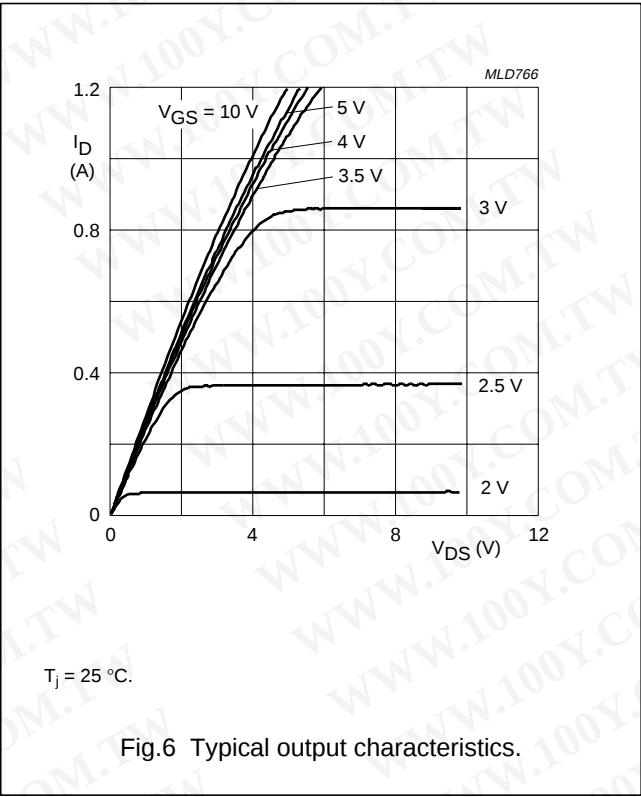
V_{GS} = 0; f = 1 MHz; T_j = 25 °C.

Fig.5 Capacitance as a function of drain-source voltage; typical values.

N-channel enhancement mode
vertical D-MOS transistor

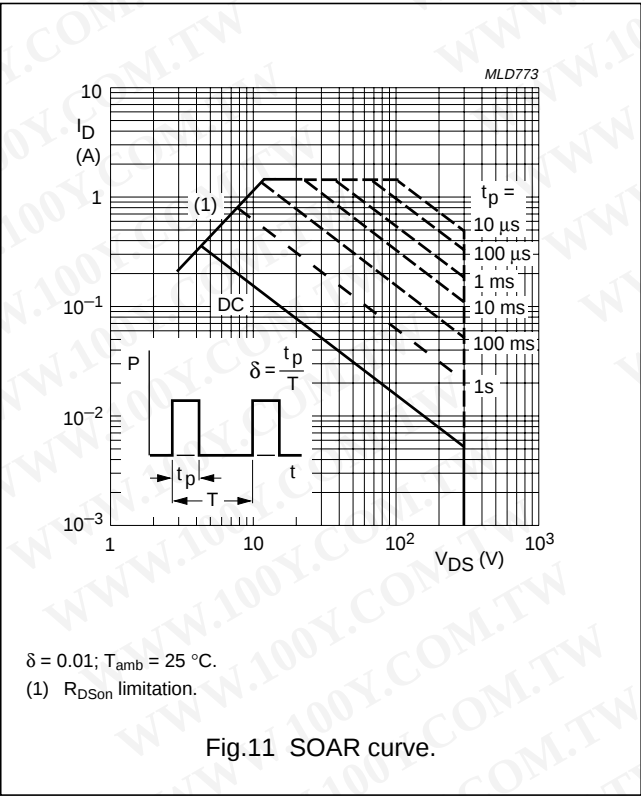
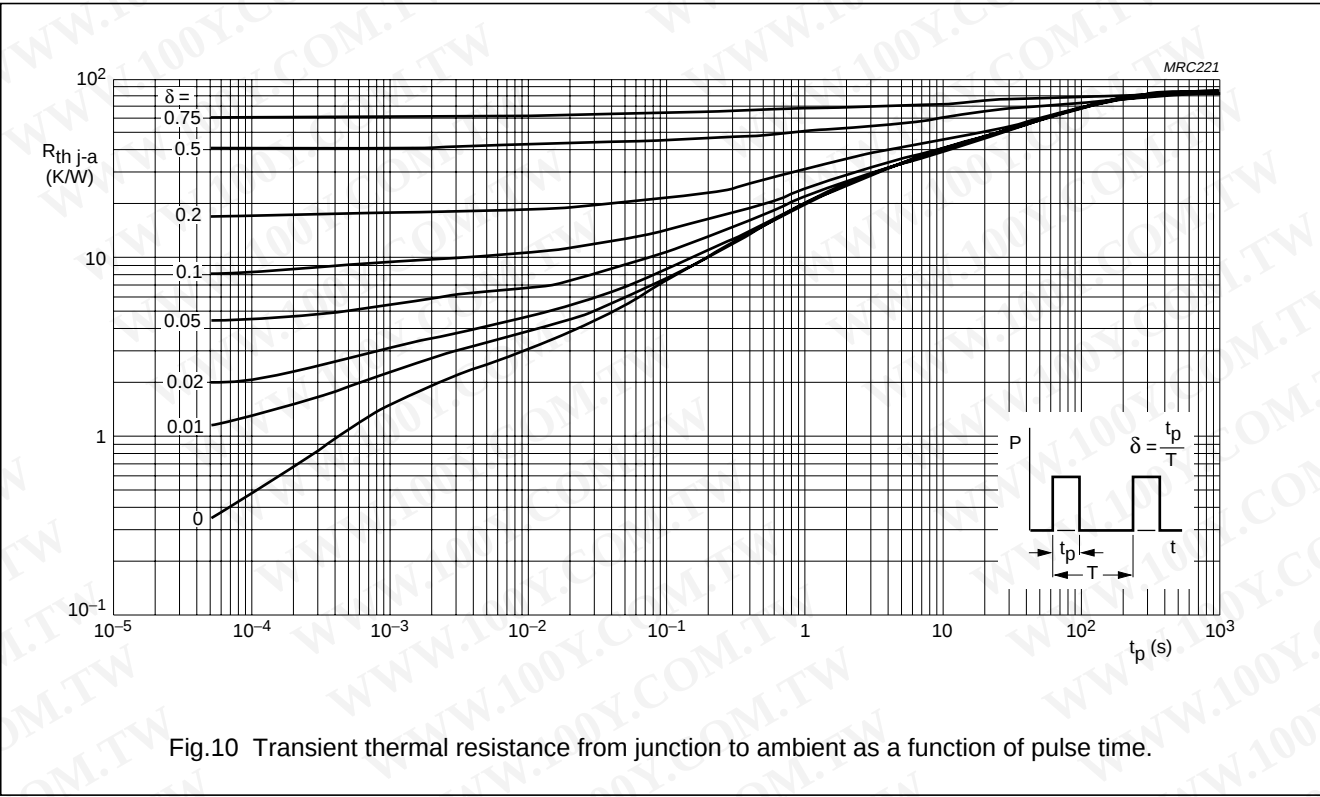
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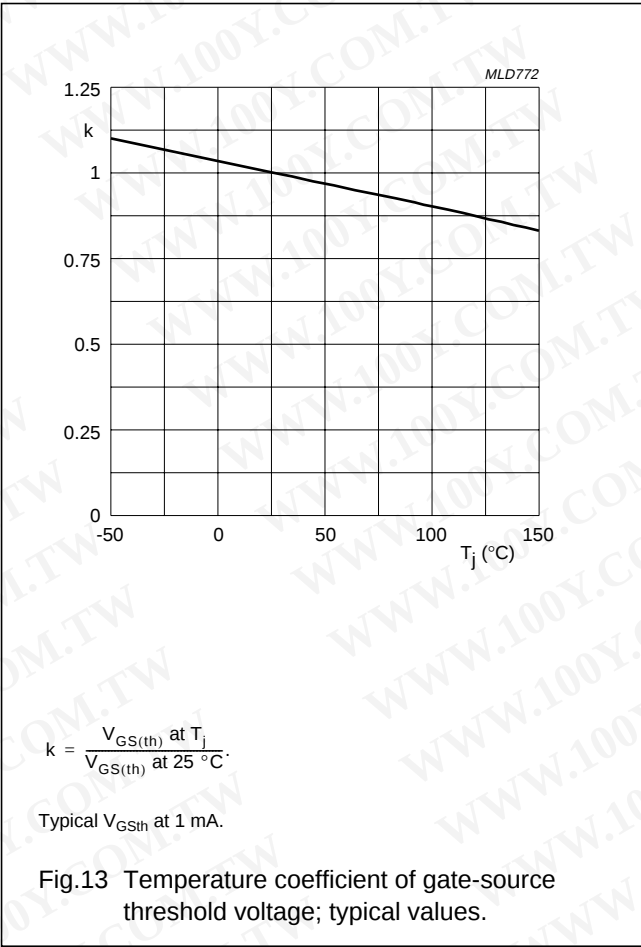
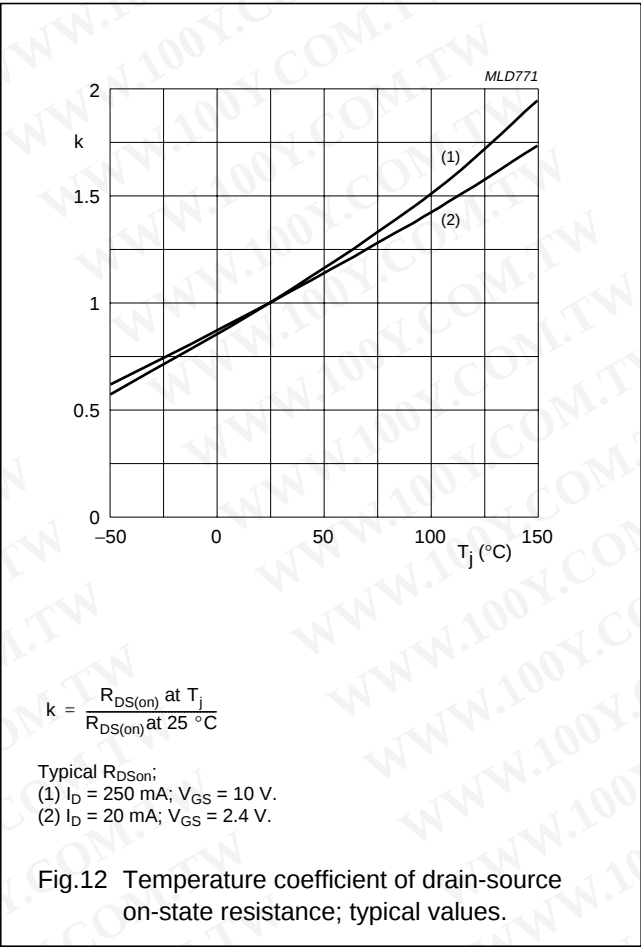
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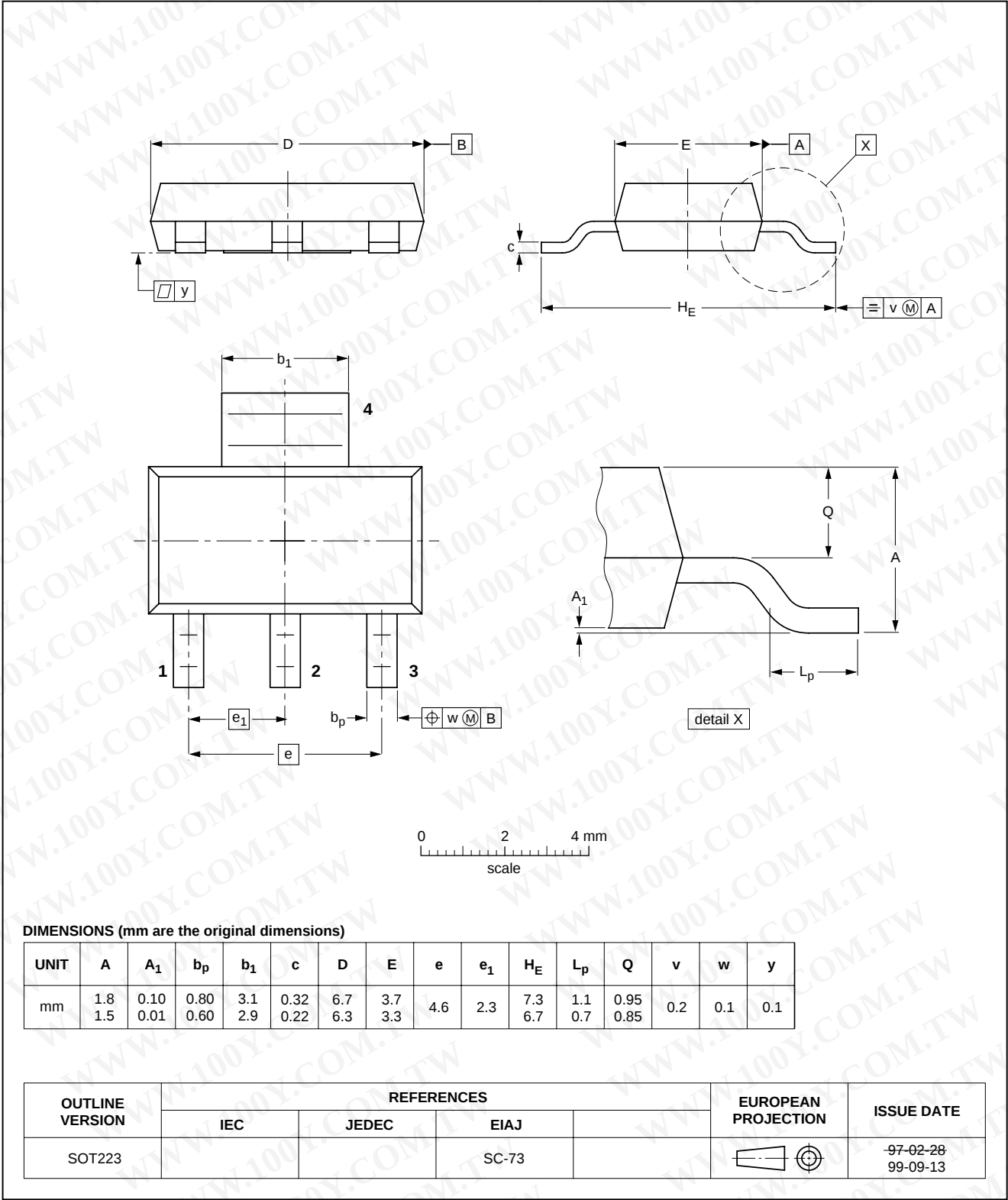
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PACKAGE OUTLINE

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

SOT223



N-channel enhancement mode vertical D-MOS transistor

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DATA SHEET STATUS

DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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