

DATA SHEET

BSP110

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

Product specification
File under Discrete Semiconductors, SC13b

April 1995

N-channel enhancement mode vertical D-MOS transistor

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DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a miniature SOT223 envelope and designed for use in telephone ringer circuits and for application in relay, high-speed and line transformer drivers.

FEATURES

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

QUICK REFERENCE DATA

Drain-source voltage	V_{DS}	max.	80 V
Drain source voltage (non-repetitive peak; $t_p \leq 2$ ms)	$V_{DS(SM)}$	max.	100 V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20 V
Drain current (DC)	I_D	max.	325 mA
Total power dissipation up to $T_{amb} = 25$ °C	P_{tot}	max.	1.5 W
Drain-source ON-resistance $I_D = 200$ mA; $V_{GS} = 10$ V	$R_{DS(on)}$	typ.	4.5 Ω
		max.	7 Ω
Transfer admittance $I_D = 200$ mA; $V_{DS} = 15$ V	$ Y_{fs} $	min.	75 mS
		typ.	150 mS

PINNING - SOT223

- 1 = gate
- 2 = drain
- 3 = source
- 4 = drain

MARKING CODE

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PIN CONFIGURATION

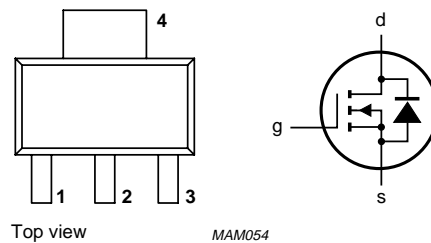


Fig.1 Simplified outline and symbol.

N-channel enhancement mode vertical D-MOS transistor

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RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	V_{DS}	max.	80 V
Drain-source voltage (non-repetitive peak; $t_p \leq 2$ ms)	$V_{DS(SM)}$	max.	100 V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20 V
Drain current (DC)	I_D	max.	325 mA
Drain current (peak)	I_{DM}	max.	650 mA
Total power dissipation up to $T_{amb} = 25$ °C (note 1)	P_{tot}	max.	1.5 W
Storage temperature range	T_{stg}		-65 to + 150 °C
Junction temperature	T_j	max.	150 °C

THERMAL RESISTANCE

From junction to ambient (note 1)	$R_{th\ j-a}$	=	83.3 K/W
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Note

- Device mounted on an epoxy printed-circuit board 40 mm × 40 mm × 1.5 mm; mounting pad for the drain lead min. 6 cm².

CHARACTERISTICS

 $T_j = 25$ °C unless otherwise specified

Drain-source breakdown voltage $I_D = 10$ μA; $V_{GS} = 0$	$V_{(BR)\ DSS}$	min.	80 V
Drain-source leakage current $V_{DS} = 60$ V; $V_{GS} = 0$	I_{DSS}	max.	1.0 μA
Gate-source leakage current $V_{GS} = 20$ V; $V_{DS} = 0$	I_{GSS}	max.	100 nA
Gate threshold voltage $I_D = 1$ mA; $V_{DS} = V_{GS}$	$I_{GS(th)}$	min. max.	0.8 V 2.8 V
Drain-source ON-resistance (see Fig.4) $I_D = 150$ mA; $V_{GS} = 5$ V	$R_{DS(on)}$	typ. max.	7 Ω 10 Ω
$I_D = 200$ mA; $V_{GS} = 10$ V	$R_{DS(on)}$	typ. max.	4.5 Ω 7 Ω
Transfer admittance $I_D = 200$ mA; $V_{DS} = 5$ V	$ Y_{fs} $	min. typ.	75 mS 150 mS
Input capacitance at $f = 1$ MHz; $V_{DS} = 10$ V; $V_{GS} = 0$	C_{iss}	typ. max.	15 pF 30 pF

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Output capacitance at $f = 1 \text{ MHz}$;

$V_{DS} = 10 \text{ V}$; $V_{GS} = 0$

C_{oss}	typ.	13 pF
	max.	20 pF

Feedback capacitance at $f = 1 \text{ MHz}$;

$V_{DS} = 10 \text{ V}$; $V_{GS} = 0$

C_{rss}	typ.	3 pF
	max.	6 pF

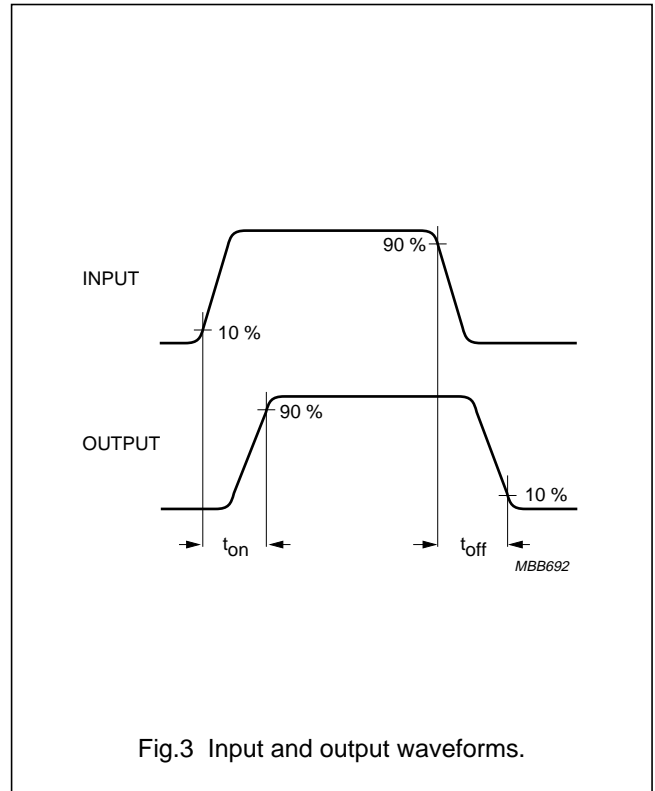
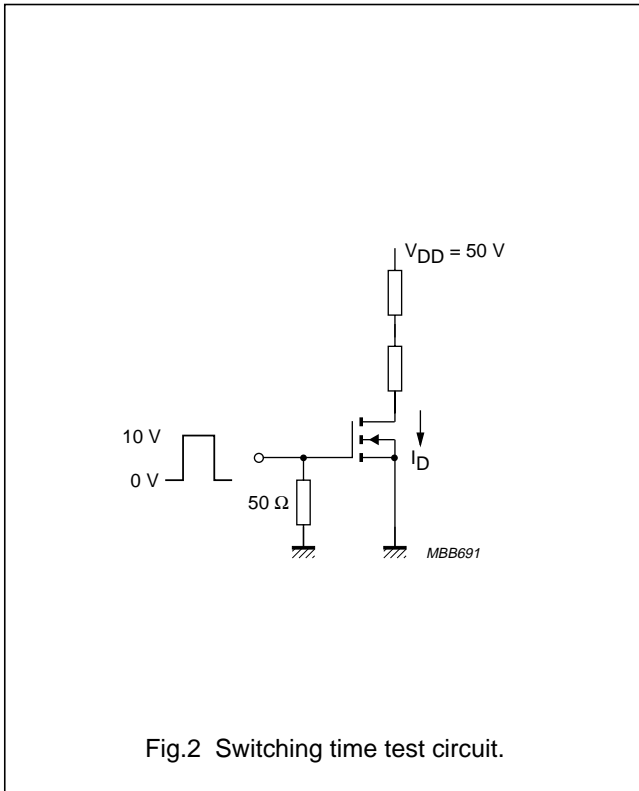
Switching times (see Figs 2 and 3)

$I_D = 200 \text{ mA}$; $V_{DD} = 50 \text{ V}$;

$V_{GS} = 0 \text{ to } 10 \text{ V}$

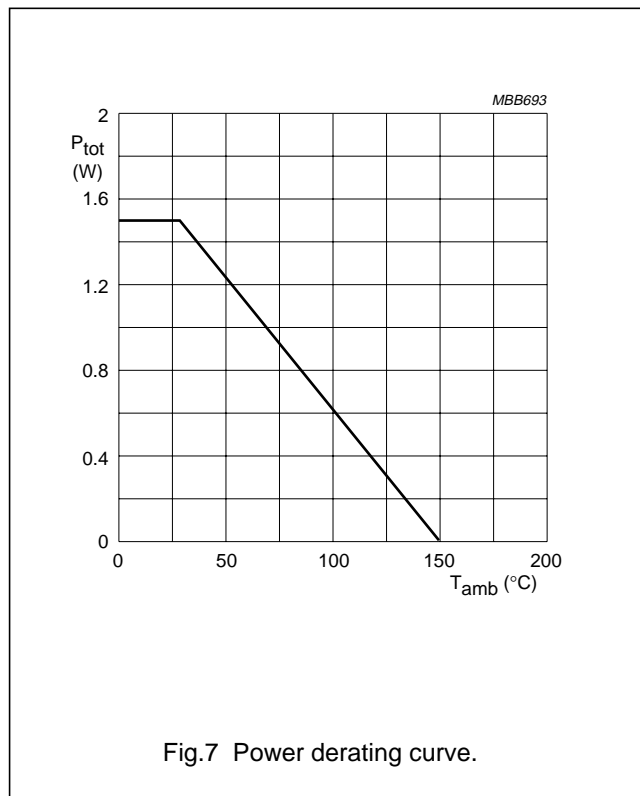
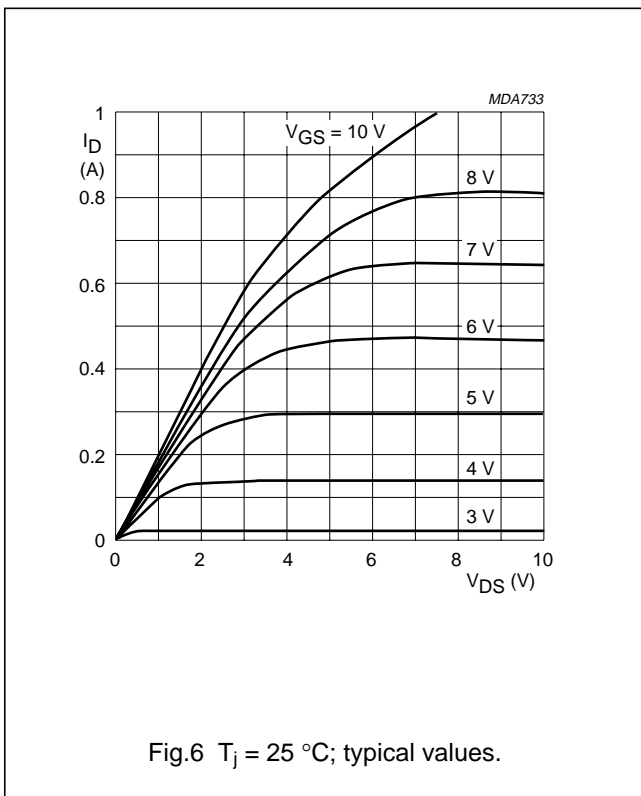
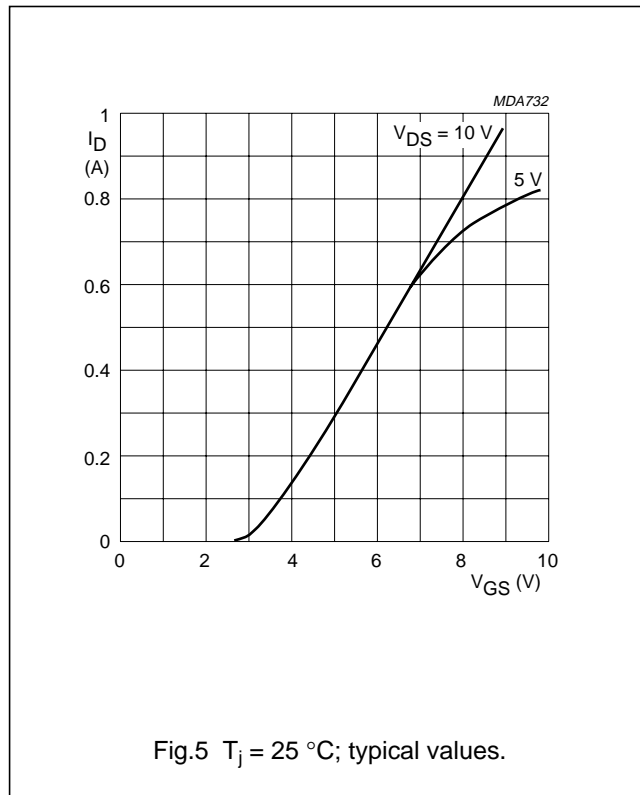
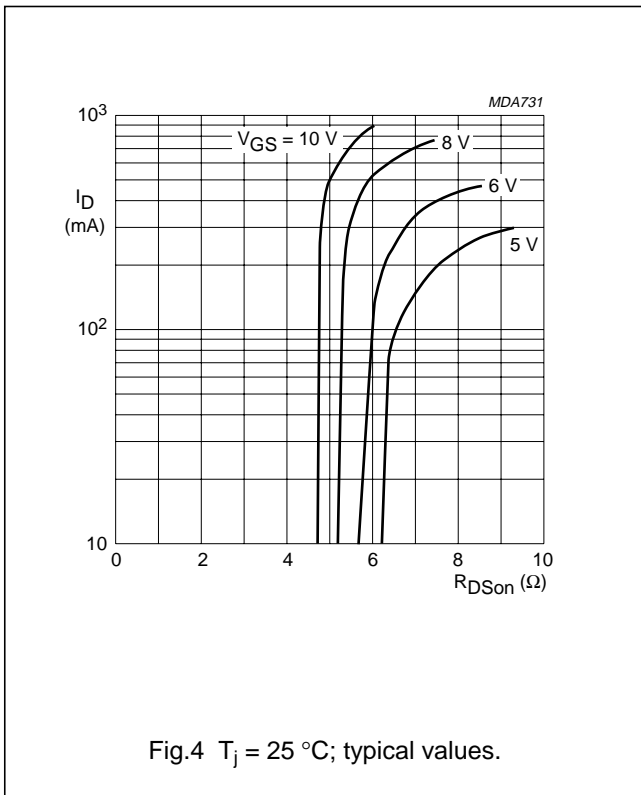
t_{on}	typ.	2 ns
	max.	5 ns

t_{off}	typ.	5 ns
	max.	10 ns



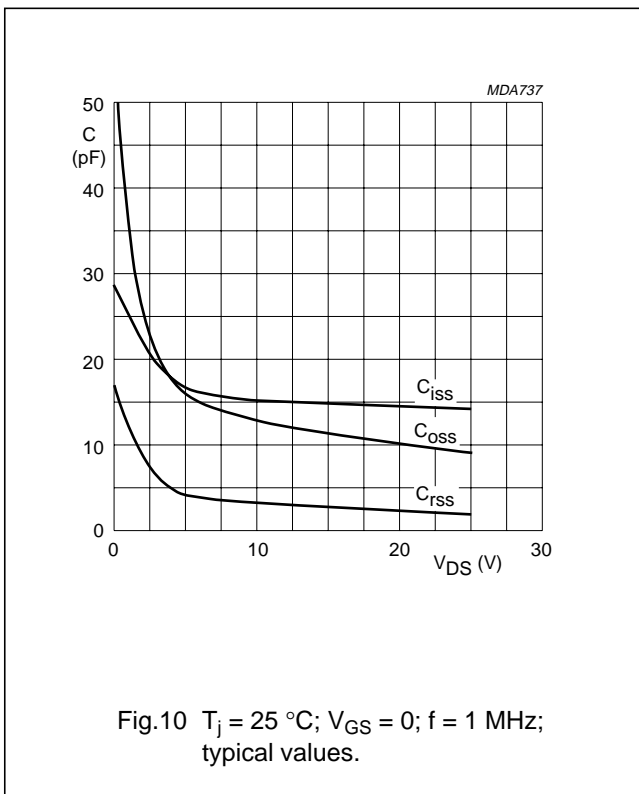
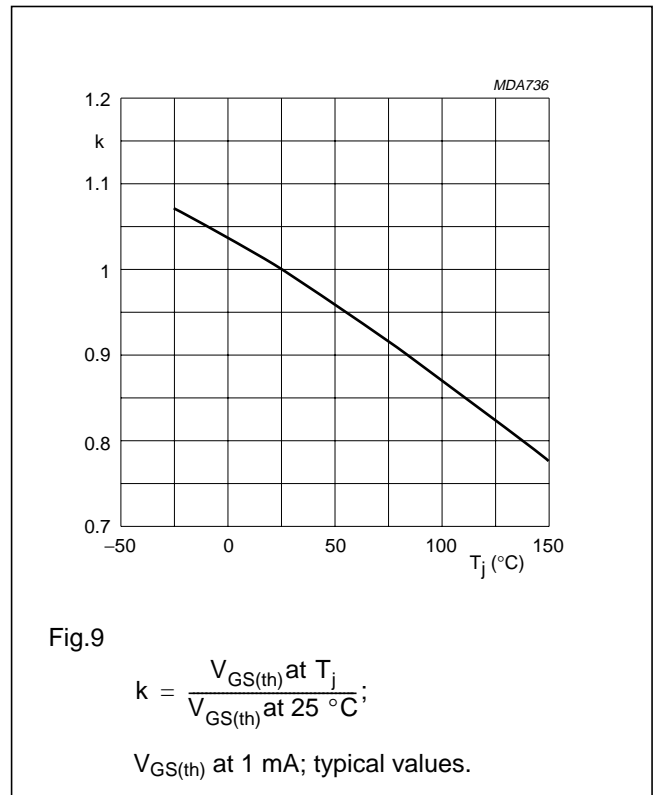
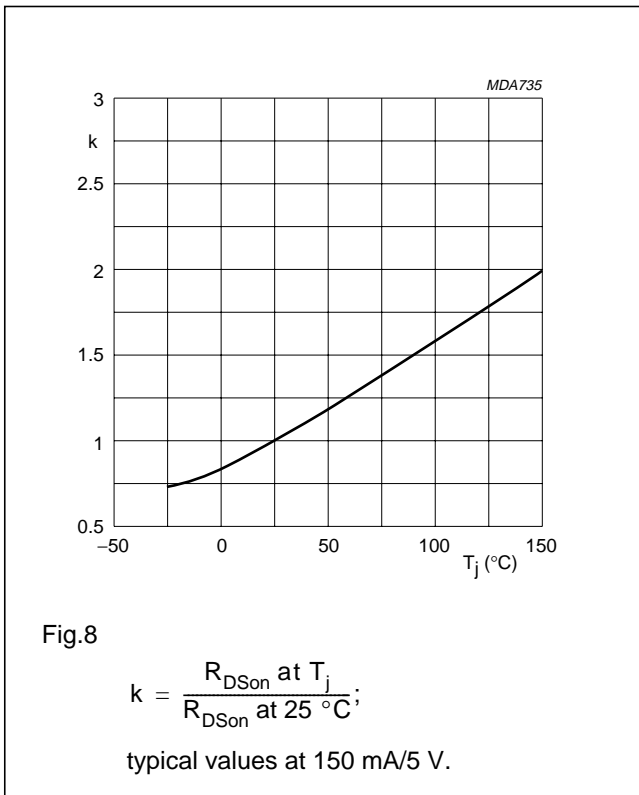
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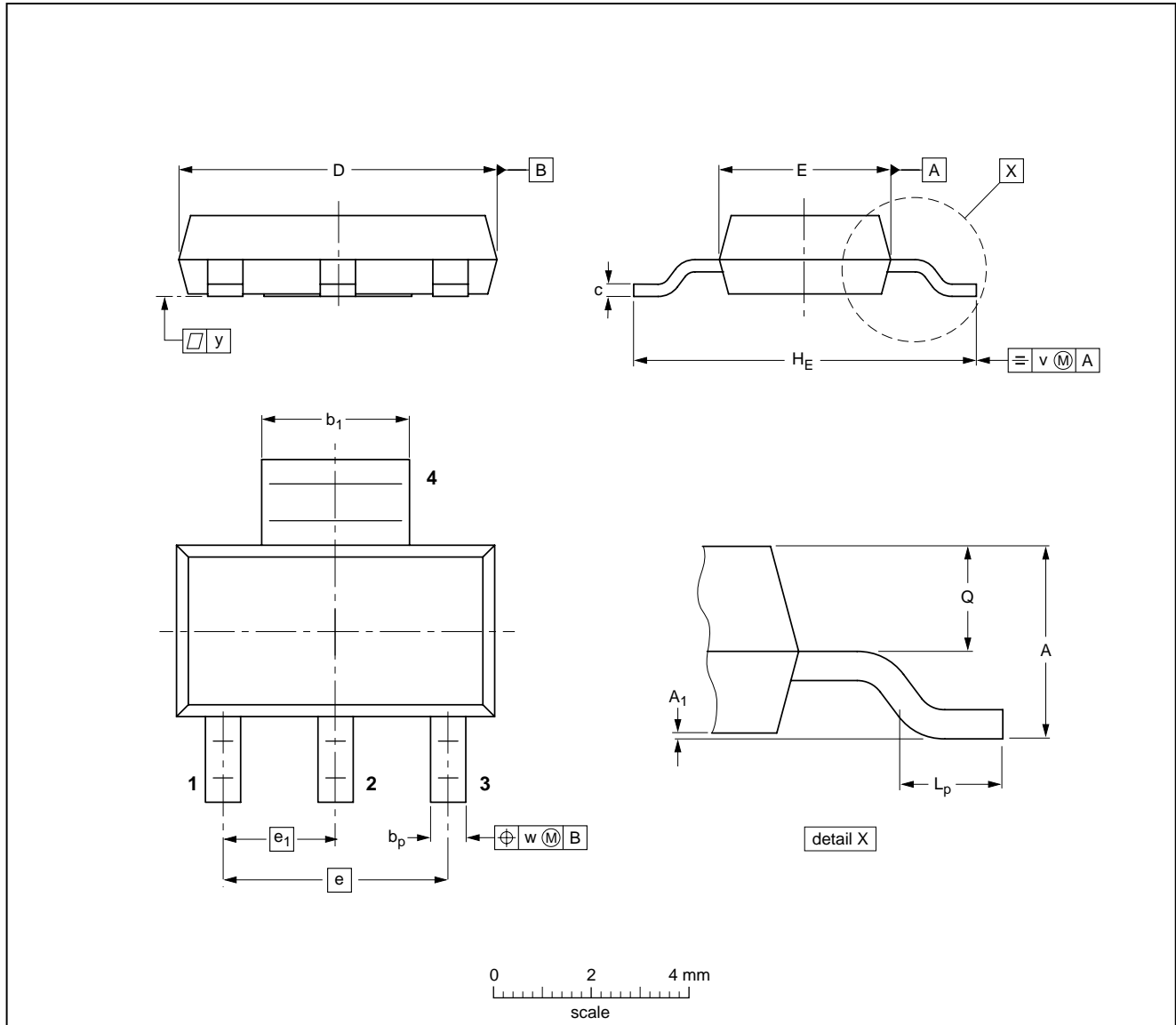
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PACKAGE OUTLINE

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						96-11-11 97-02-28

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Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
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