

# DATA SHEET

## **BST86**

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

**BST86**

## DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in SOT89 envelope and designed for use as Surface Mounted Device (SMD) in thin and thick-film circuits for application with relay, high-speed and line-transformer drivers.

## FEATURES

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

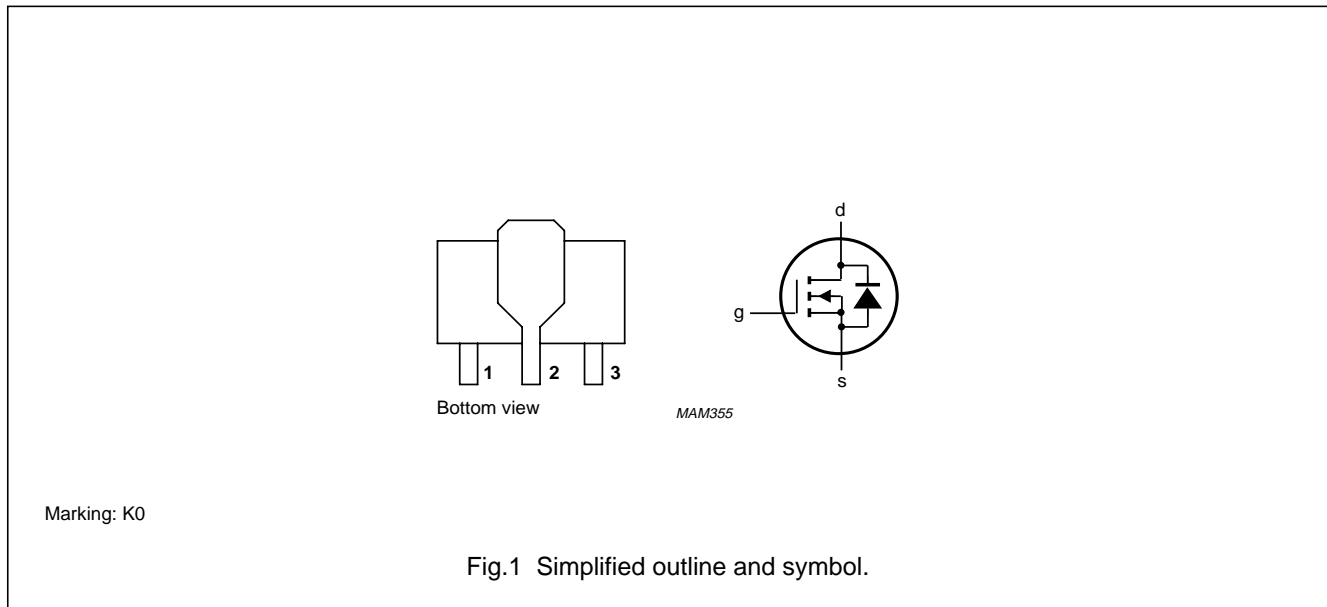
## QUICK REFERENCE DATA

Drain-source voltage	$V_{DS}$	max.	180 V
Drain-source voltage (non-repetitive peak; $t_p \leq 2$ ms)	$V_{DS(SM)}$	max.	200 V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20 V
Drain current (DC)	$I_D$	max.	300 mA
Total power dissipation up to $T_{amb} = 25$ °C	$P_{tot}$	max.	1 W
Drain-source ON-resistance $I_D = 15$ mA; $V_{GS} = 3$ V	$R_{DS(on)}$	typ.	7 $\Omega$
		max.	10 $\Omega$
Transfer admittance $I_D = 300$ mA; $V_{DS} = 15$ V	$ Y_{fs} $	typ.	250 mS

## PINNING - SOT89

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

## PIN CONFIGURATION



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### RATINGS

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

Drain-source voltage	$V_{DS}$	max.	180 V
Drain-source voltage (non-repetitive peak; $t_p \leq 2$ ms)	$V_{DS(SM)}$	max.	200 V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20 V
Drain current (DC)	$I_D$	max.	300 mA
Drain current (peak)	$I_{DM}$	max.	800 mA
Total power dissipation up to $T_{amb} = 25$ °C (note 1)	$P_{tot}$	max.	1 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)	$R_{th\ j-a}$	=	125 K/W
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### Note

1. Transistor mounted on a ceramic substrate of 2.5 cm<sup>2</sup> and thickness of 0.7 mm.

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#### CHARACTERISTICS

$T_j = 25\text{ °C}$  unless otherwise specified

Drain-source breakdown voltage

$$I_D = 100\ \mu\text{A}; V_{GS} = 0$$

$$V_{(BR)DSS} \quad \text{min.} \quad 180\ \text{V}$$

Drain-source leakage current

$$V_{DS} = 120\ \text{V}; V_{GS} = 0$$

$$I_{DSS} \quad \text{max.} \quad 10\ \mu\text{A}$$

Gate-source leakage current

$$V_{GS} = 20\ \text{V}; V_{DS} = 0$$

$$I_{GSS} \quad \text{max.} \quad 100\ \text{nA}$$

Gate threshold voltage

$$I_D = 100\ \mu\text{A}; V_{DS} = V_{GS}$$

$$V_{GS(th)} \quad \text{min.} \quad 0.7\ \text{V}$$

$$\quad \text{max.} \quad 2.7\ \text{V}$$

Drain-source ON-resistance

$$I_D = 15\ \text{mA}; V_{GS} = 3\ \text{V}$$

$$R_{DS(on)} \quad \text{typ.} \quad 7\ \Omega$$

$$\quad \text{max.} \quad 10\ \Omega$$

$$I_D = 300\ \text{mA}; V_{GS} = 10\ \text{V}$$

$$R_{DS(on)} \quad \text{typ.} \quad 6\ \Omega$$

Transfer admittance

$$I_D = 300\ \text{mA}; V_{DS} = 15\ \text{V}$$

$$|Y_{fs}| \quad \text{typ.} \quad 250\ \text{mS}$$

Input capacitance at  $f = 1\ \text{MHz}$

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

$$C_{iss} \quad \text{typ.} \quad 50\ \text{pF}$$

$$\quad \text{max.} \quad 65\ \text{pF}$$

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

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

$$C_{oss} \quad \text{typ.} \quad 20\ \text{pF}$$

$$\quad \text{max.} \quad 30\ \text{pF}$$

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

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

$$C_{rss} \quad \text{typ.} \quad 6\ \text{pF}$$

$$\quad \text{max.} \quad 10\ \text{pF}$$

Switching times (see as 2 and 3)

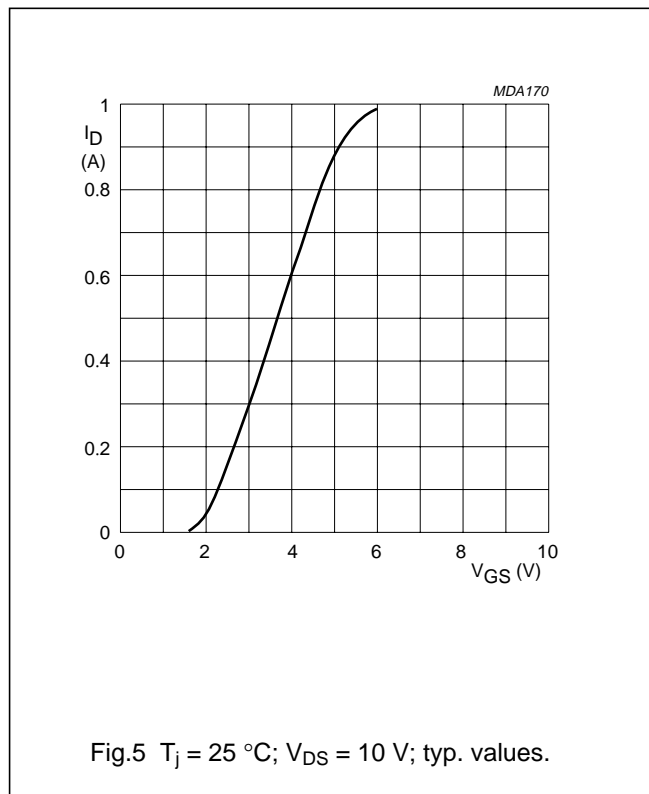
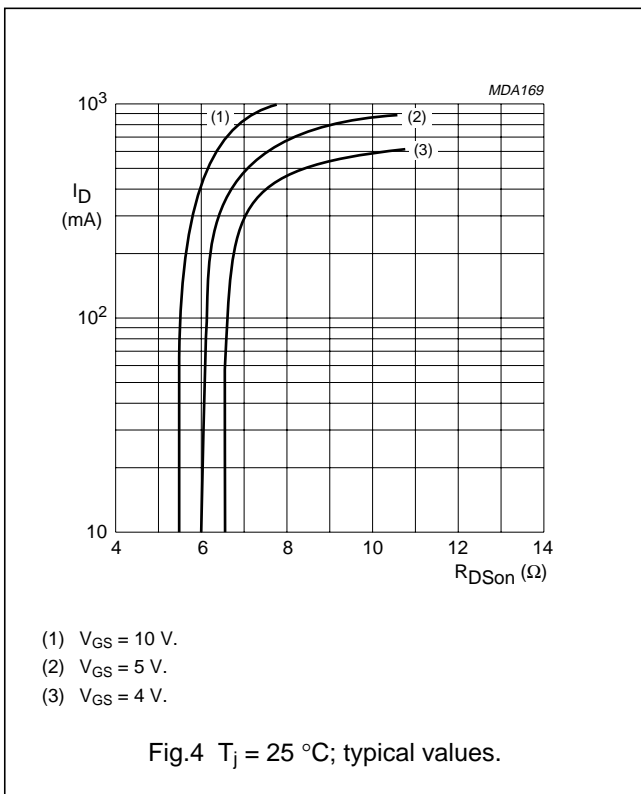
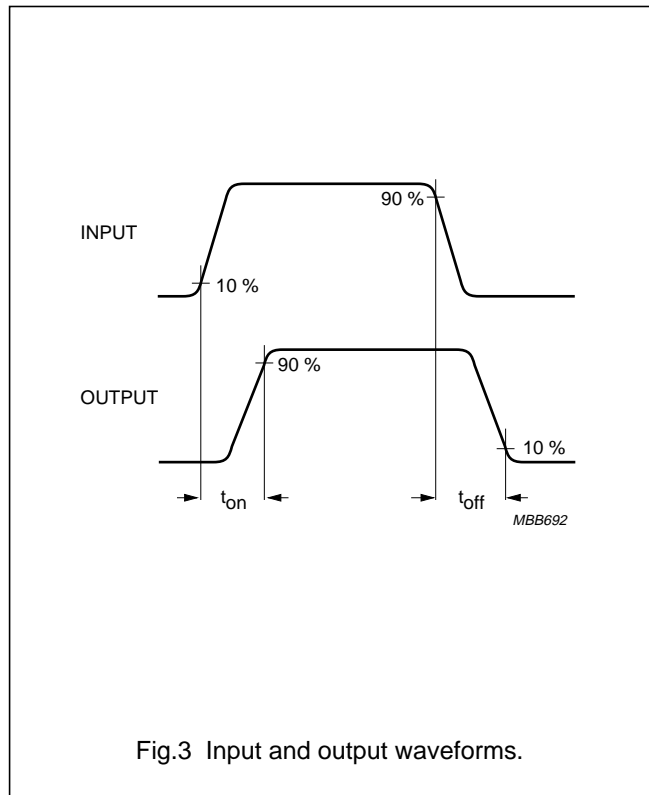
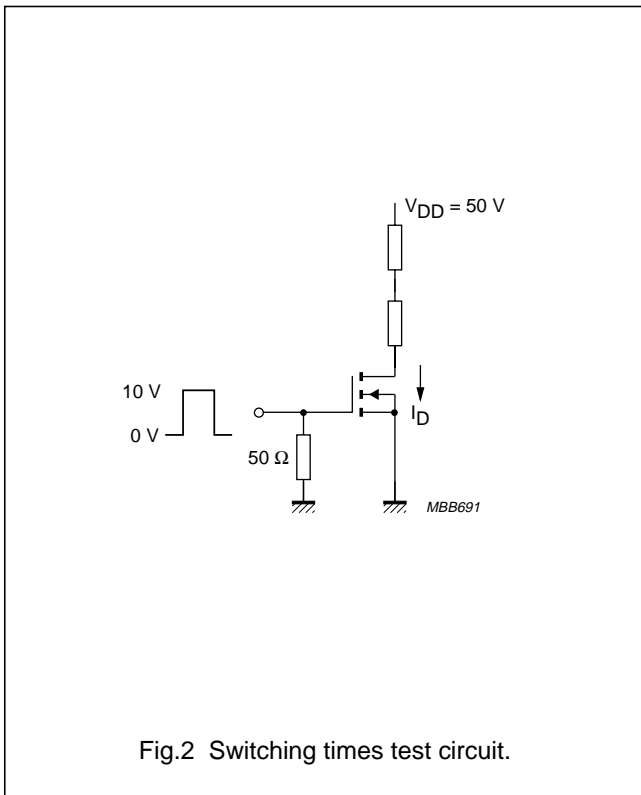
$$I_D = 300\ \text{mA}; V_{DD} = 50\ \text{V}; V_{GS} = 0\ \text{to}\ 10\ \text{V}$$

$$t_{on} \quad \text{max.} \quad 10\ \text{ns}$$

$$t_{off} \quad \text{max.} \quad 15\ \text{ns}$$

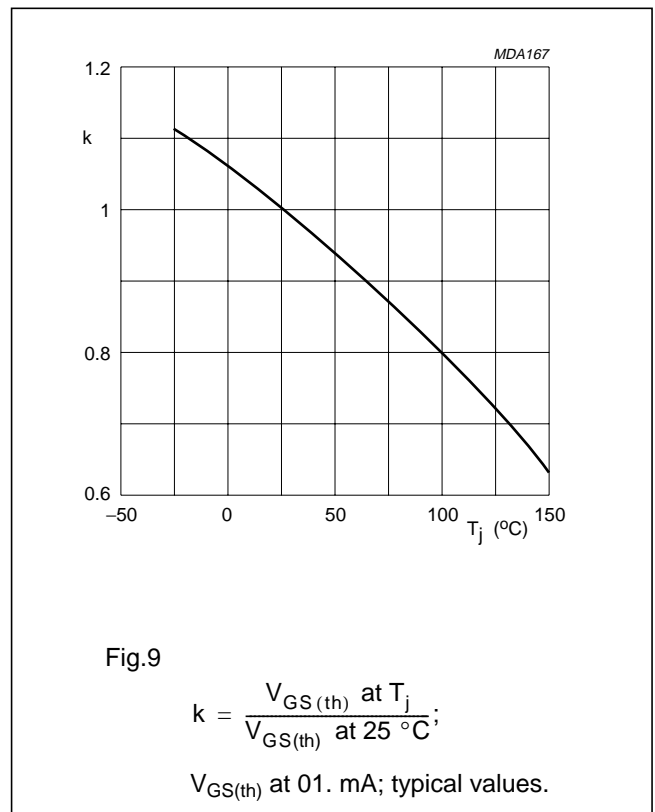
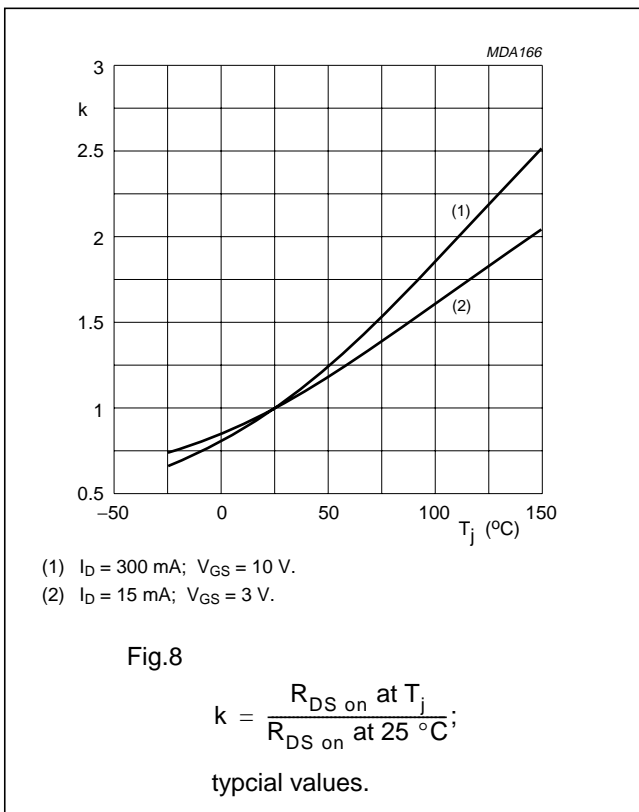
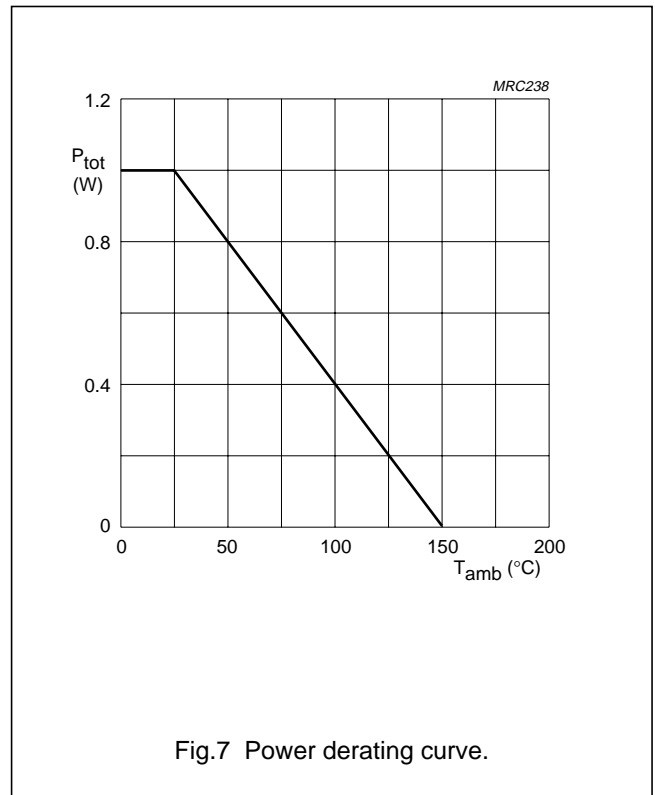
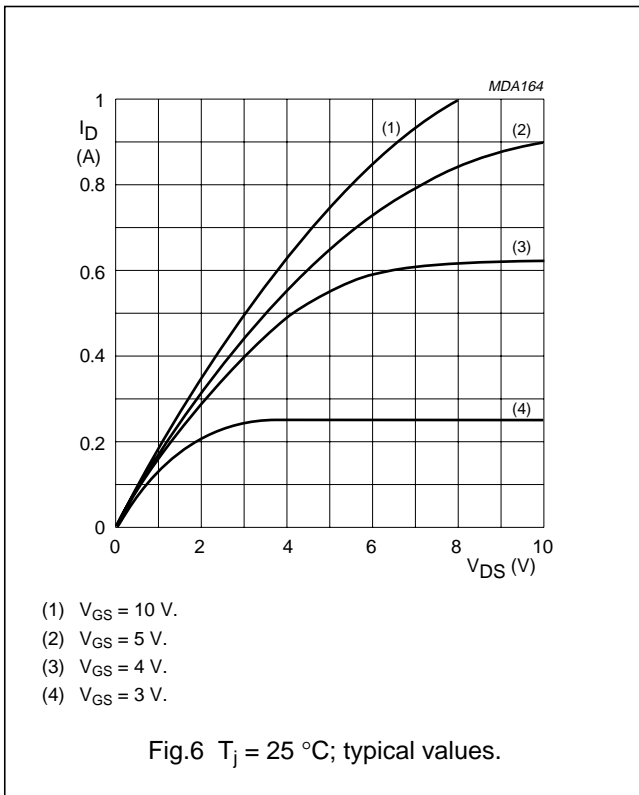
# N-channel enhancement mode vertical D-MOS transistor

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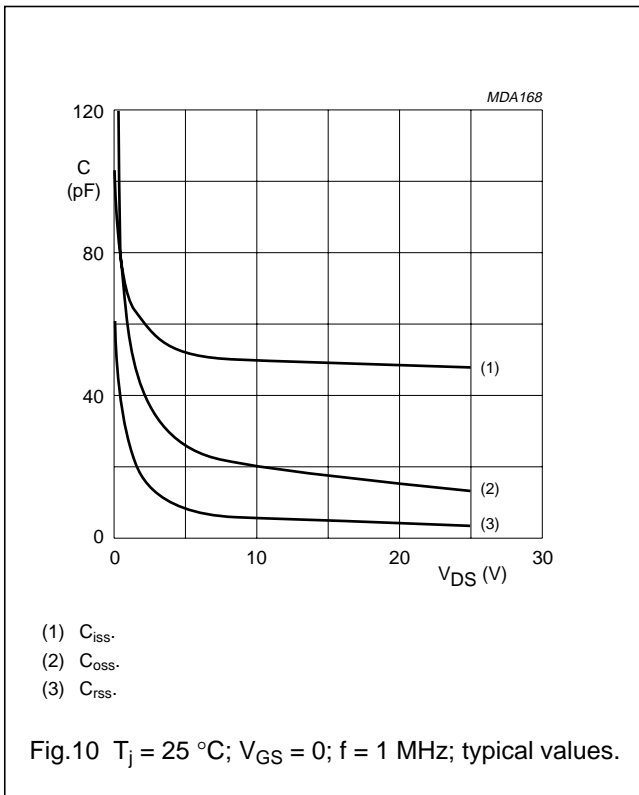
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# N-channel enhancement mode vertical D-MOS transistor

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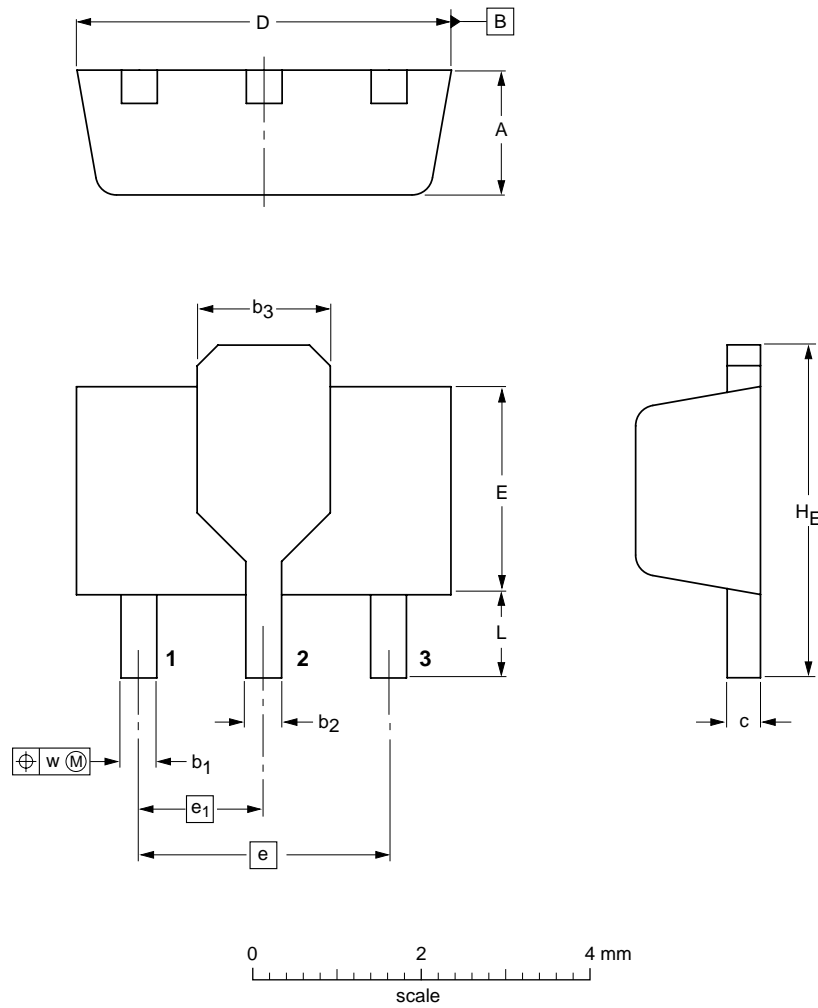
# N-channel enhancement mode vertical D-MOS transistor

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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 <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	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						97-02-28

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**BST86****DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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**NOTES**

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**NOTES**

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