

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

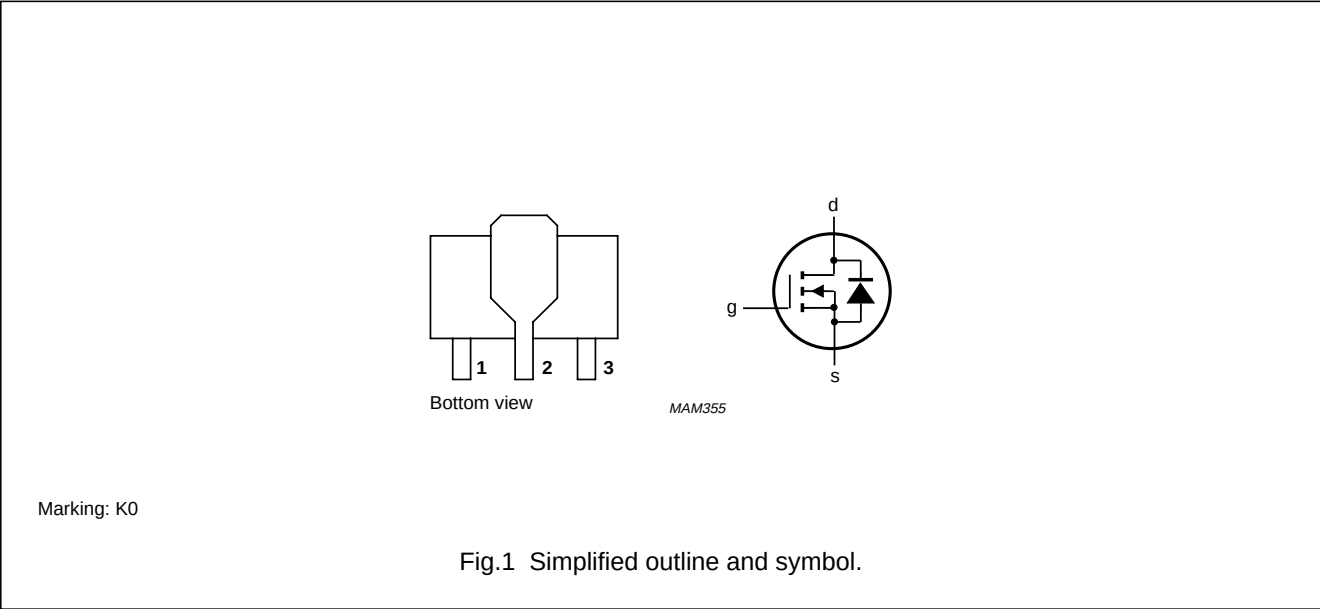
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DESCRIPTION	QUICK REFERENCE DATA				
N-channel enhancement mode vertical D-MOS transistor in SOT89 envelope and designed for use as Surface Mounted Device (SMD) in thin and thick-film circuits for application with relay, high-speed and line-transformer drivers.	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 $T_{amb} = 25\text{ }^{\circ}\text{C}$	P_{tot}	max.	1	W
FEATURES	Drain-source ON-resistance $I_D = 15\text{ mA}; V_{GS} = 3\text{ V}$	$R_{DS(on)}$	typ.	7	Ω
			max.	10	Ω
• Direct interface to C-MOS, TTL, etc. • High-speed switching • No second breakdown	Transfer admittance $I_D = 300\text{ mA}; V_{DS} = 15\text{ V}$	$ Y_{fs} $	typ.	250	mS

PINNING - SOT89

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

PIN CONFIGURATION



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BST86

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 cm² and thickness of 0.7 mm.

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BST86
CHARACTERISTICS
 $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Drain-source breakdown voltage

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

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

Drain-source leakage current

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

I_{DSS} max. 10 μA

Gate-source leakage current

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

I_{GSS} max. 100 nA

Gate threshold voltage

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

$V_{GS(th)}$ min. 0.7 V
max. 2.7 V

Drain-source ON-resistance

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

$R_{DS(on)}$ typ. 7 Ω
max. 10 Ω

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

$R_{DS(on)}$ typ. 6 Ω

Transfer admittance

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

$|Y_{fs}|$ typ. 250 mS

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

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

C_{iss} typ. 50 pF
max. 65 pF

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

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

C_{oss} typ. 20 pF
max. 30 pF

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

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

C_{rss} typ. 6 pF
max. 10 pF

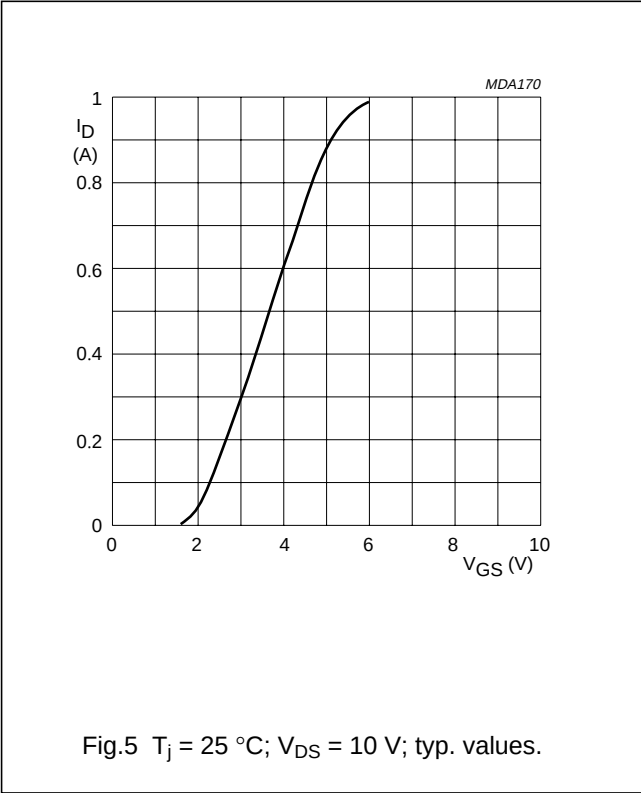
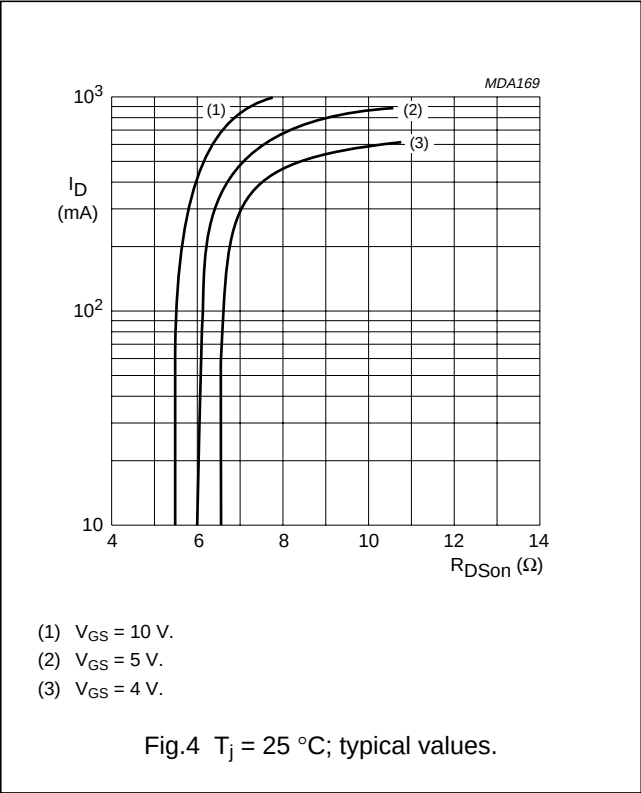
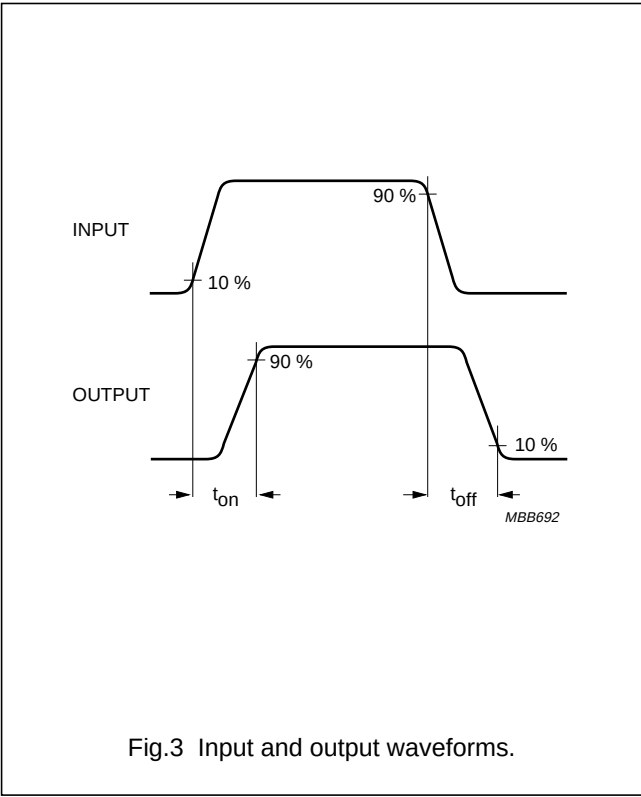
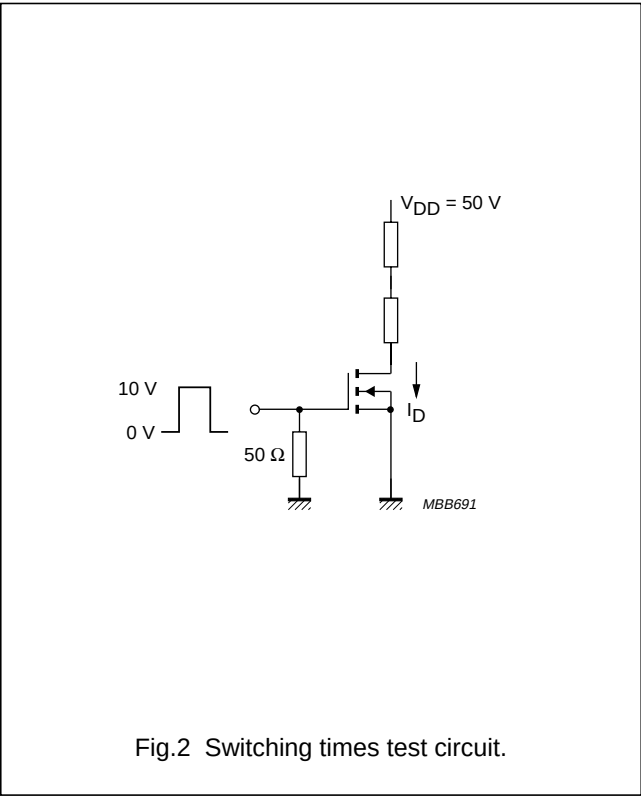
Switching times (see as 2 and 3)

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

t_{on} max. 10 ns
 t_{off} max. 15 ns

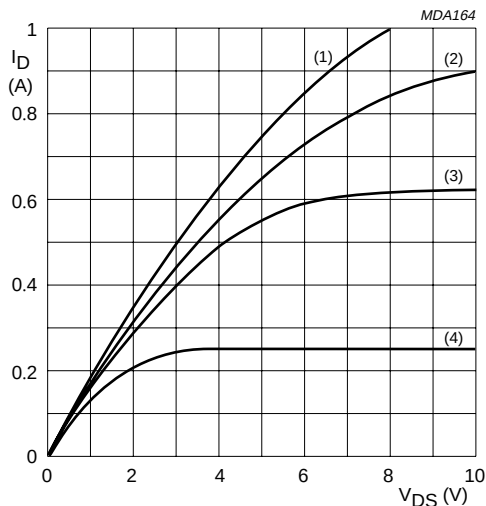
N-channel enhancement mode vertical
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BST86



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BST86



- (1) $V_{GS} = 10\text{ V.}$
- (2) $V_{GS} = 5\text{ V.}$
- (3) $V_{GS} = 4\text{ V.}$
- (4) $V_{GS} = 3\text{ V.}$

Fig.6 $T_j = 25\text{ }^{\circ}\text{C}$; typical values.

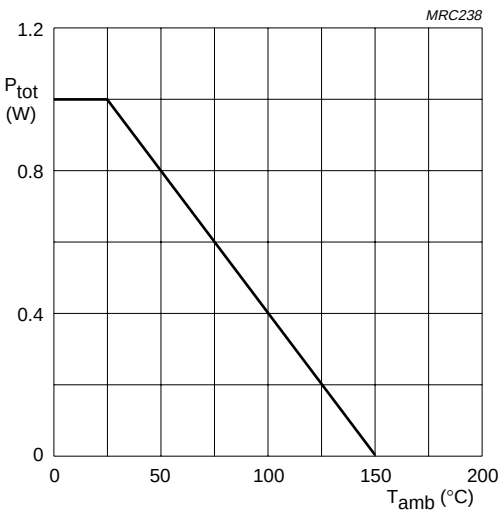
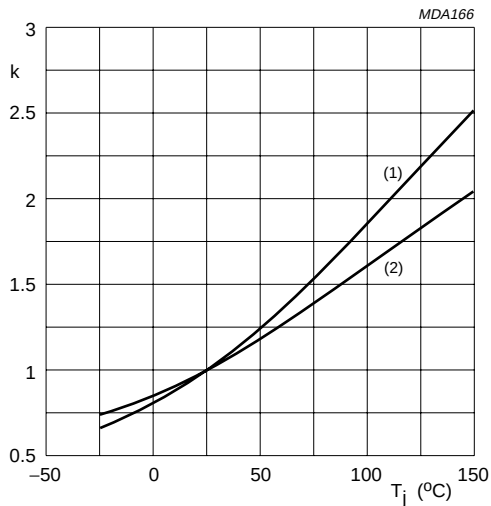


Fig.7 Power derating curve.



- (1) $I_D = 300\text{ mA; } V_{GS} = 10\text{ V.}$
- (2) $I_D = 15\text{ mA; } V_{GS} = 3\text{ V.}$

Fig.8

$$k = \frac{R_{DS\text{ on at } T_j}}{R_{DS\text{ on at } 25\text{ }^{\circ}\text{C}}};$$

typical values.

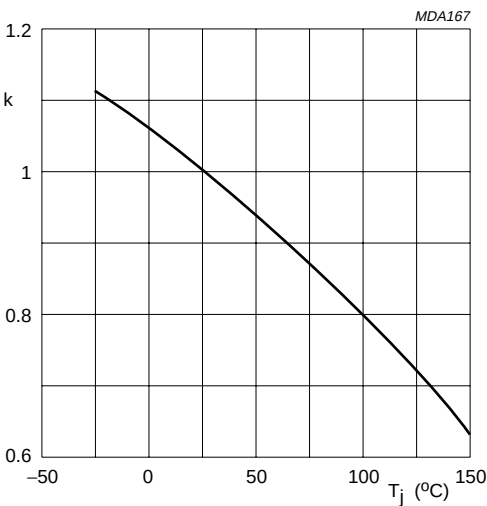


Fig.9

$$k = \frac{V_{GS(th)}\text{ at } T_j}{V_{GS(th)}\text{ at } 25\text{ }^{\circ}\text{C}};$$

$V_{GS(th)}$ at 01. mA; typical values.

N-channel enhancement mode vertical D-MOS transistor

BST86

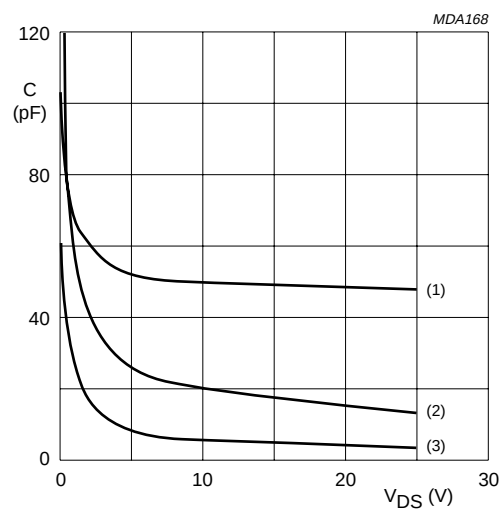
(1) C_{iss} .(2) C_{oss} .(3) C_{rss} .

Fig.10 $T_j = 25\text{ }^{\circ}\text{C}$; $V_{GS} = 0$; $f = 1\text{ MHz}$; typical values.

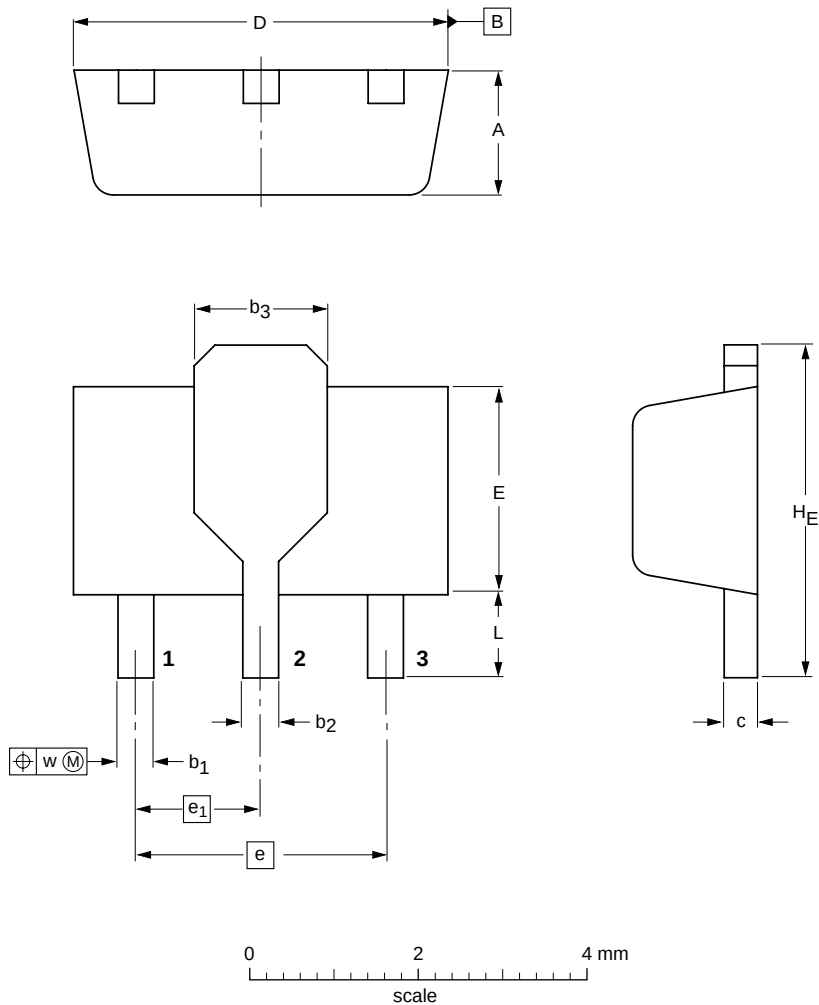
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BST86

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						97-02-28

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BST86**DEFINITIONS**

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.
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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BST86

NOTES

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D-MOS transistor

BST86

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