

# DATA SHEET

## **BST72A** N-channel vertical D-MOS transistor

Product specification  
File under Discrete Semiconductors, SC13b

April 1995

# N-channel vertical D-MOS transistor

# BST72A

### DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in TO-92 variant envelope and designed for use in telephone ringer circuits and for application with relay, high-speed and line-transformer drivers.

### FEATURES

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

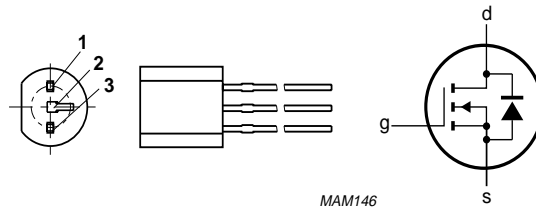
### QUICK REFERENCE DATA

Drain-source voltage	$V_{DS}$	max.	80 V
Drain-source voltage (non-repetitive peak; $t_p \leq 2$ ms)	$V_{DS(SM)}$	max.	100 V
Gate-source voltage (open drain)	$V_{GSO}$	max.	20 V
Drain current (DC)	$I_D$	max.	300 mA
Total power dissipation up to $T_{amb} = 25$ °C	$P_{tot}$	max.	0.83 W
Drain-source ON-resistance $I_D = 150$ mA; $V_{GS} = 5$ V	$R_{DS(on)}$	typ.	7 $\Omega$
		max.	10 $\Omega$
Transfer admittance $I_D = 200$ mA; $V_{DS} = 5$ V	$ Y_{fs} $	typ.	150 mS

### PINNING - TO-92 VARIANT

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

### PIN CONFIGURATION



**Note:** Various pinout configurations available.

Fig.1 Simplified outline and symbol.

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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)	$V_{GSO}$	max.	20 V
Drain current (DC)	$I_D$	max.	300 mA
Drain current (peak)	$I_{DM}$	max.	600 mA
Total power dissipation up to $T_{amb} = 25$ °C (note 1)	$P_{tot}$	max.	0.83 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)	$R_{th\ j-a}$	=	150 K/W
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**Note**

1. Transistor mounted on printed circuit board, max. lead length 4 mm.

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**CHARACTERISTICS**

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

Drain-source breakdown voltage

$$I_D = 10\ \mu\text{A}; V_{GS} = 0$$

$$V_{(BR)DS} \quad \text{min.} \quad 80\ \text{V}$$

Drain-source leakage current

$$V_{DS} = 60\ \text{V}; V_{GS} = 0$$

$$I_{DSS} \quad \text{max.} \quad 1.0\ \mu\text{A}$$

Gate-source leakage current

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

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

Gate threshold voltage

$$I_D = 1\ \text{mA}; V_{DS} = V_{GS}$$

$$V_{GS(th)} \quad \begin{array}{l} \text{min.} \quad 1.5\ \text{V} \\ \text{max.} \quad 3.5\ \text{V} \end{array}$$

Drain-source ON-resistance (see Fig.4)

$$I_D = 150\ \text{mA}; V_{GS} = 5\ \text{V}$$

$$R_{DS(on)} \quad \begin{array}{l} \text{typ.} \quad 7\ \Omega \\ \text{max.} \quad 10\ \Omega \end{array}$$

Transfer admittance

$$I_D = 200\ \text{mA}; V_{DS} = 5\ \text{V}$$

$$|Y_{fs}| \quad \text{typ.} \quad 150\ \text{mS}$$

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

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

$$C_{iss} \quad \begin{array}{l} \text{typ.} \quad 15\ \text{pF} \\ \text{max.} \quad 30\ \text{pF} \end{array}$$

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

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

$$C_{oss} \quad \begin{array}{l} \text{typ.} \quad 13\ \text{pF} \\ \text{max.} \quad 20\ \text{pF} \end{array}$$

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

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

$$C_{rss} \quad \begin{array}{l} \text{typ.} \quad 3\ \text{pF} \\ \text{max.} \quad 6\ \text{pF} \end{array}$$

Switching times (see Figs 2 and 3)

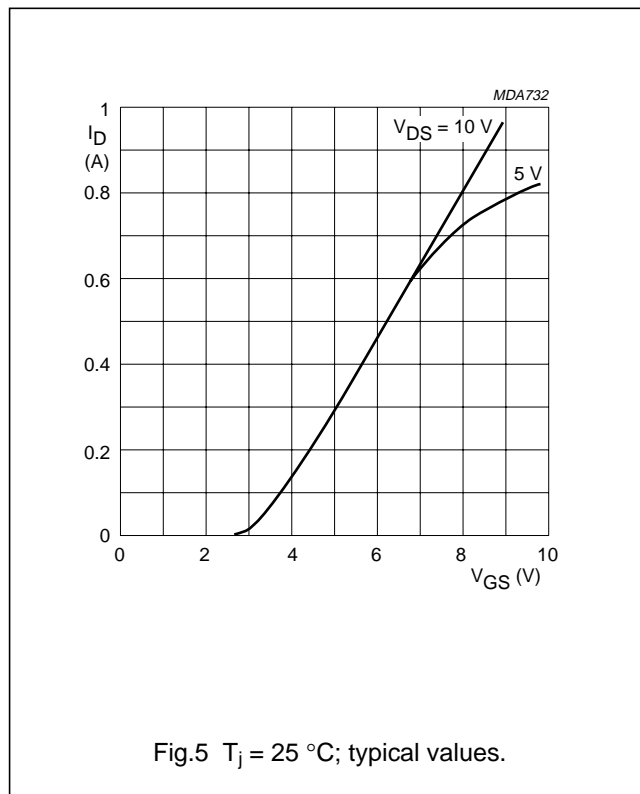
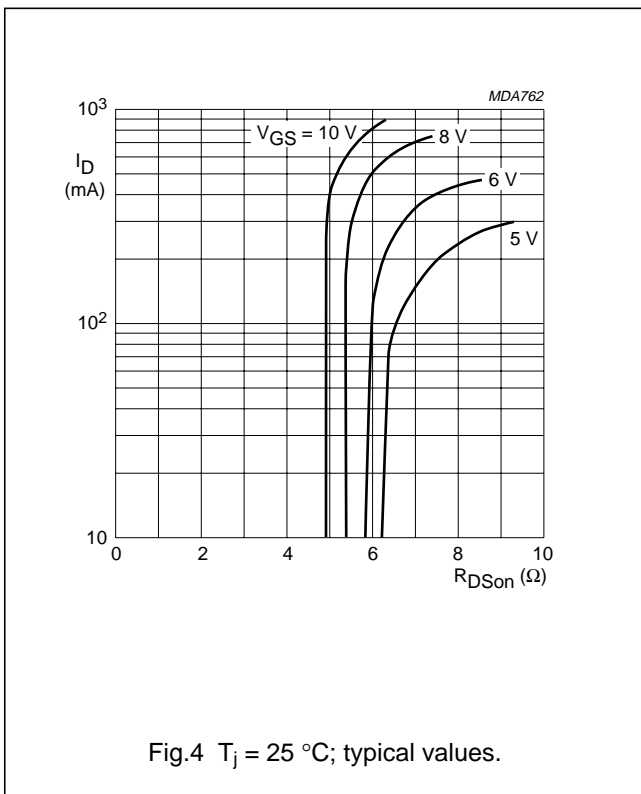
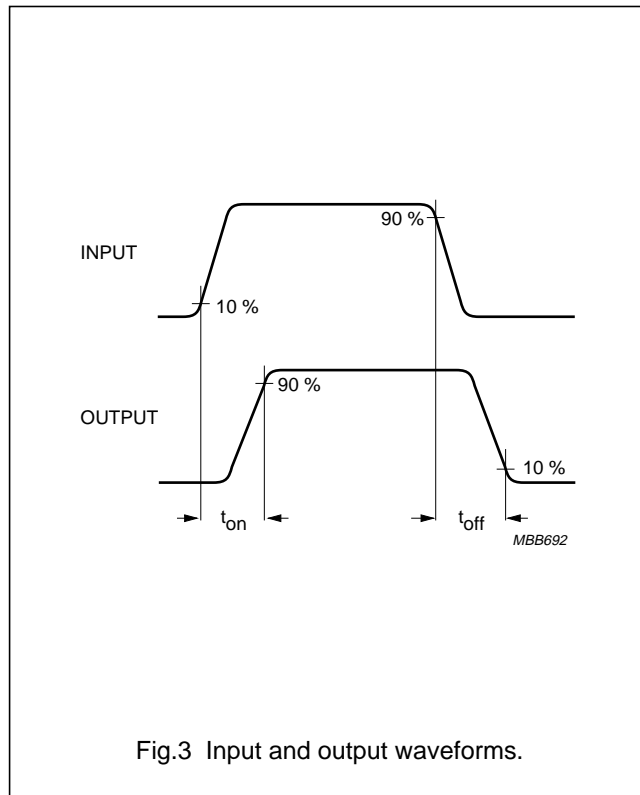
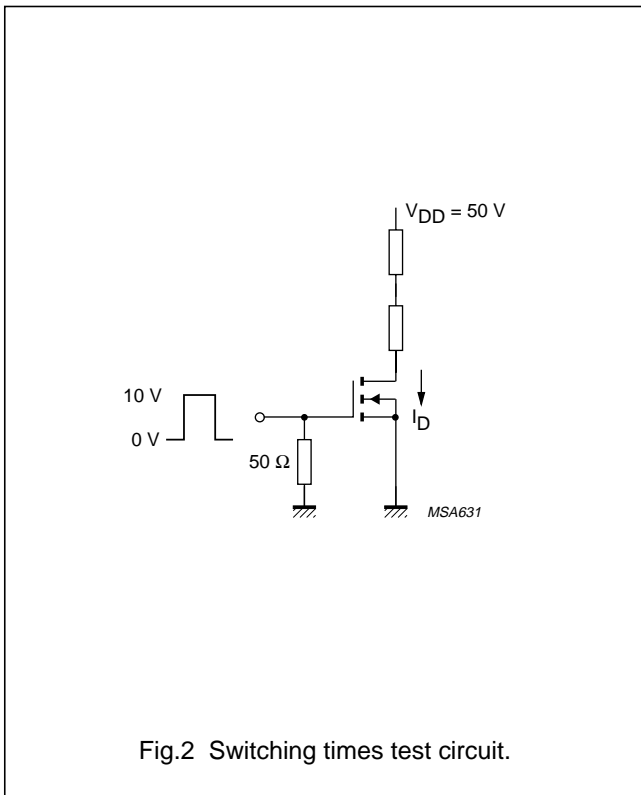
$$I_D = 200\ \text{mA}; V_{DS} = 50\ \text{V}; V_{GS} = 0\ \text{to}\ 10\ \text{V}$$

$$t_{on} \quad \begin{array}{l} \text{typ.} \quad 4\ \text{ns} \\ \text{max.} \quad 10\ \text{ns} \end{array}$$

$$t_{off} \quad \begin{array}{l} \text{typ.} \quad 4\ \text{ns} \\ \text{max.} \quad 10\ \text{ns} \end{array}$$

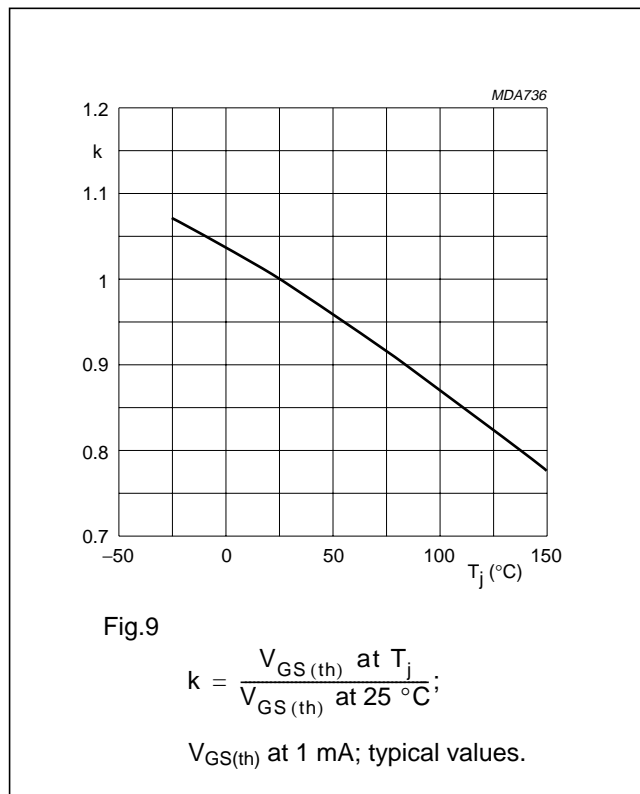
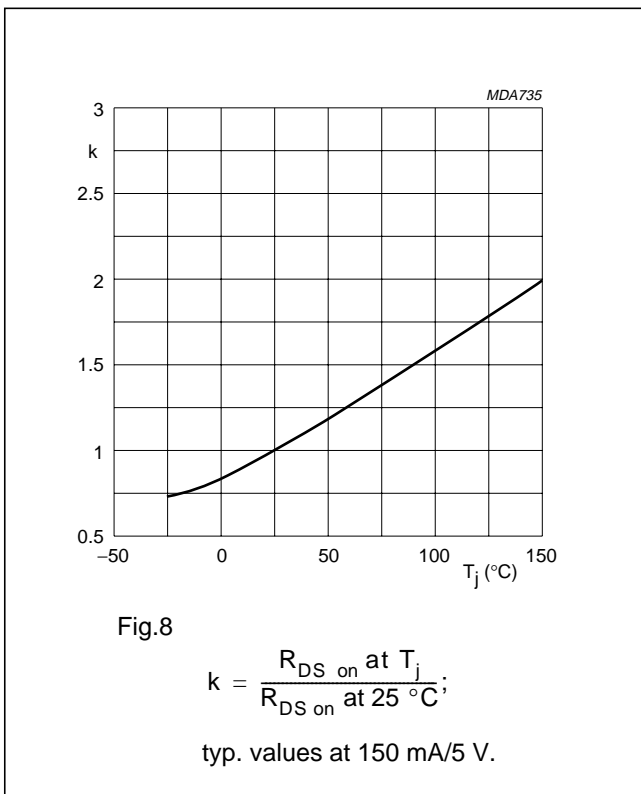
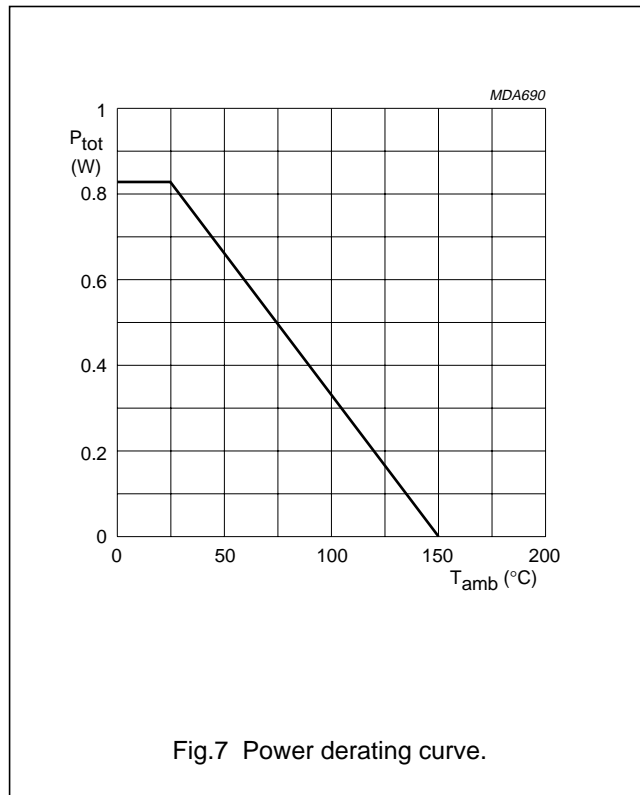
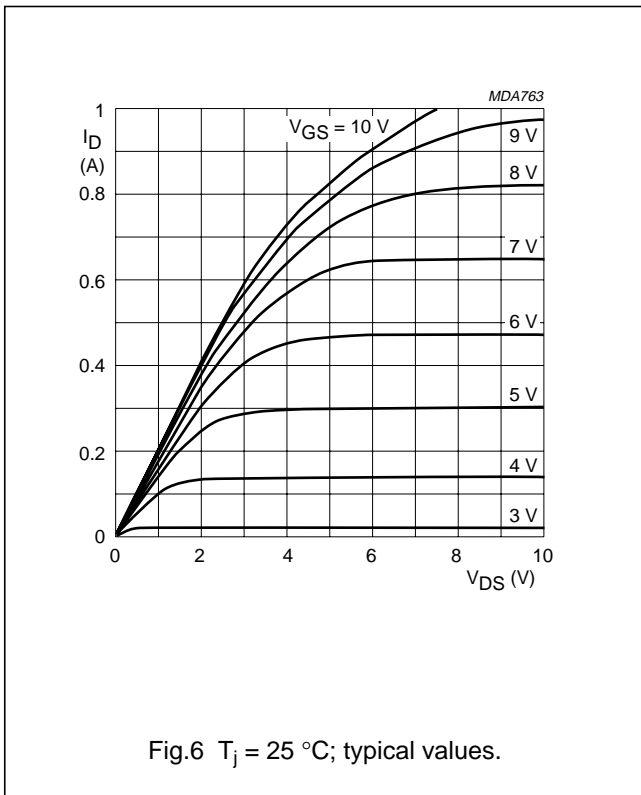
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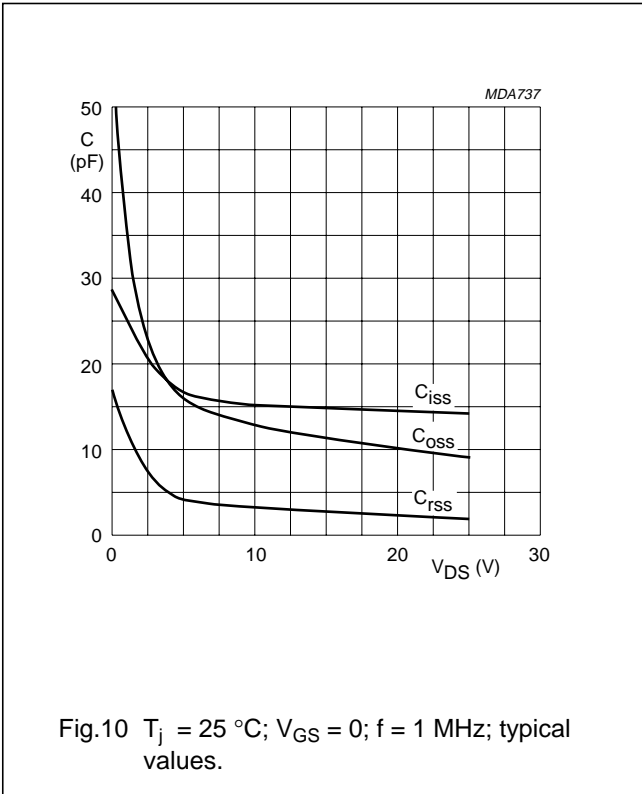
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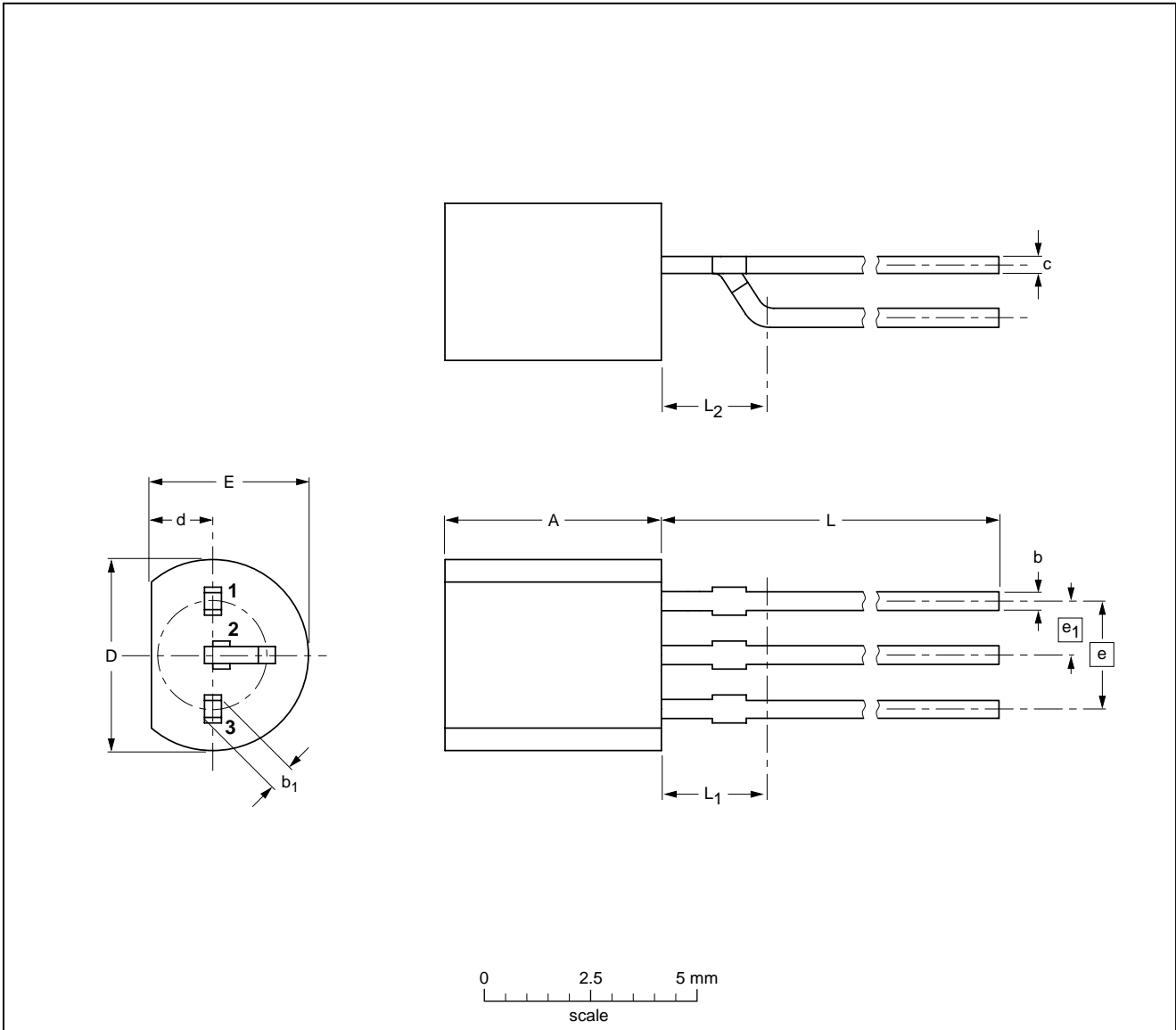
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PACKAGE OUTLINES

Plastic single-ended leaded (through hole) package; 3 leads (on-circle)

SOT54 variant



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup> max	L <sub>2</sub> max
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5	2.5

Notes

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT54 variant		TO-92	SC-43		97-04-14



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**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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