

# DATA SHEET

## **BSN10; BSN10A** N-channel enhancement mode vertical D-MOS transistors

Product specification  
File under Discrete Semiconductors, SC13b

April 1995

# N-channel enhancement mode vertical D-MOS transistors

## BSN10; BSN10A

### FEATURES

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

### DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a TO-92 envelope, intended for use in general purpose fast switching applications.

### PINNING - TO-92

PIN	DESCRIPTION
BSN10	
1	gate
2	drain
3	source
BSN10A	
1	source
2	gate
3	drain

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{DS}$	drain-source voltage	50	V
$I_D$	DC drain current	175	mA
$R_{DS(on)}$	drain-source on-resistance	15	$\Omega$
$V_{GS(th)}$	gate-source threshold voltage	1.8	V

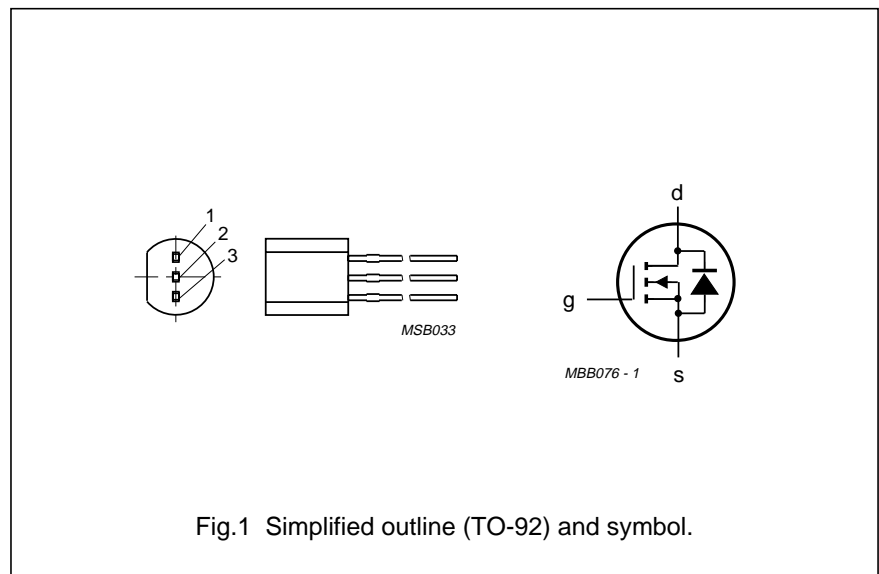


Fig.1 Simplified outline (TO-92) and symbol.

### LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	50	V
$\pm V_{GSO}$	gate-source voltage	open drain	–	20	V
$I_D$	DC drain current		–	175	mA
$I_{DM}$	peak drain current		–	300	mA
$P_{tot}$	total power dissipation	up to $T_{amb} = 25\text{ }^\circ\text{C}$ (note 1)	–	830	mW
$T_{stg}$	storage temperature range		–65	150	$^\circ\text{C}$
$T_j$	junction temperature		–	150	$^\circ\text{C}$

### THERMAL RESISTANCE

SYMBOL	PARAMETER	THERMAL RESISTANCE
$R_{th\ j-a}$	from junction to ambient (note 1)	150 K/W

### Note

1. Device mounted on a printed circuit board, maximum lead length 4 mm.

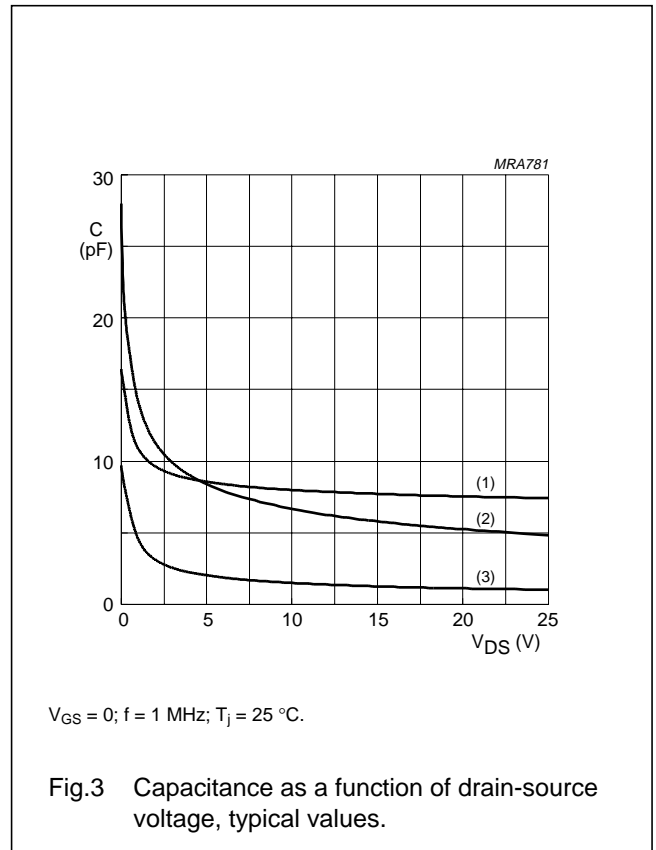
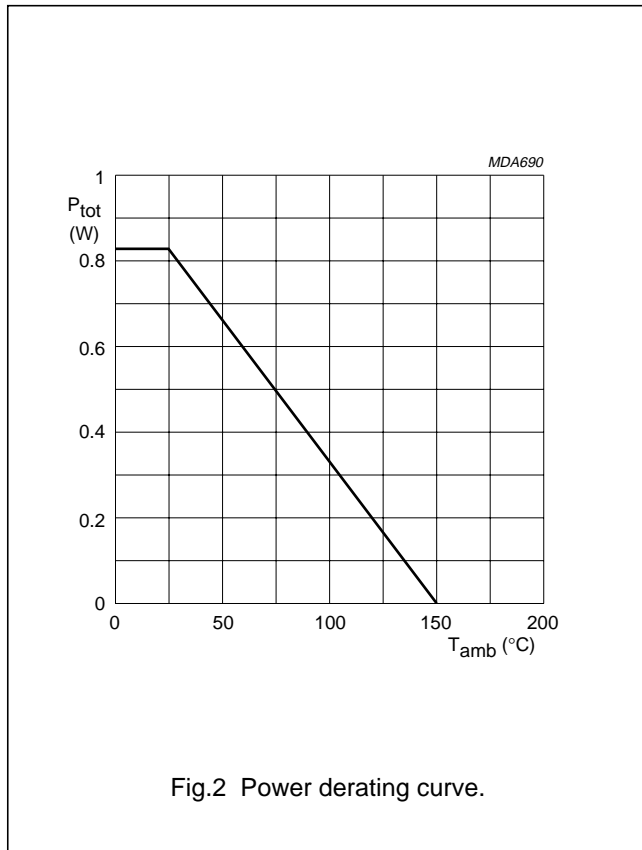
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## CHARACTERISTICS

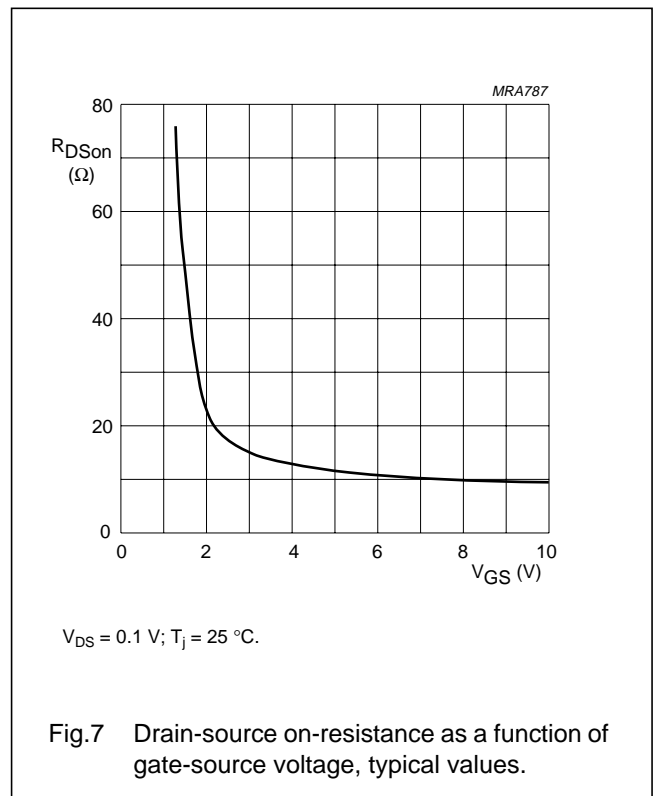
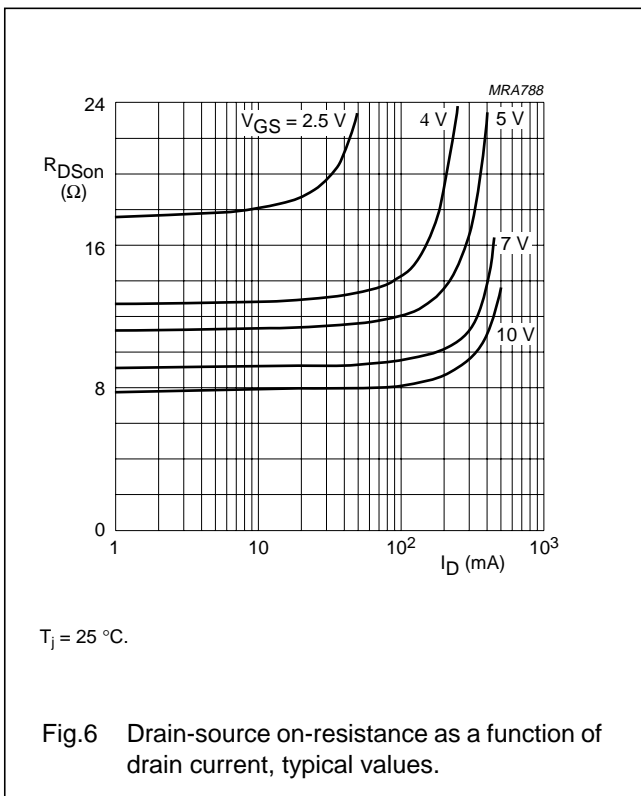
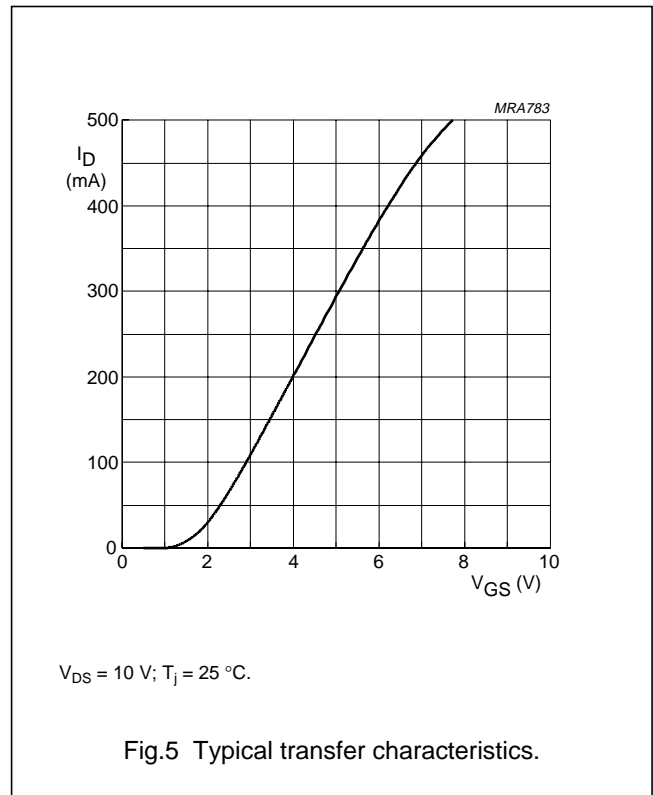
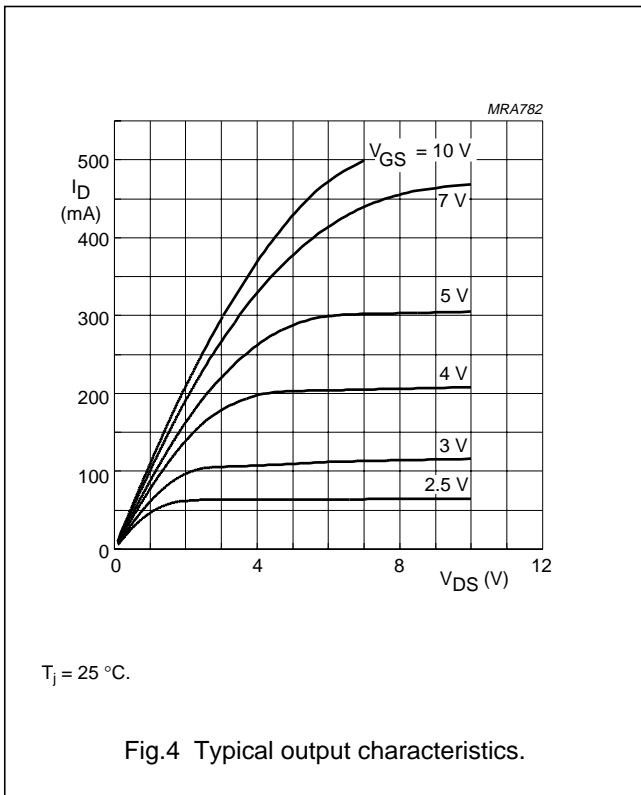
$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 10\text{ }\mu\text{A}; V_{GS} = 0$	50	–	–	V
$I_{DSS}$	drain-source leakage current	$V_{DS} = 40\text{ V}; V_{GS} = 0$	–	–	1	$\mu\text{A}$
$\pm I_{GSS}$	gate-source leakage current	$\pm V_{GS} = 20\text{ V}; V_{DS} = 0$	–	–	100	nA
$V_{GS(th)}$	gate-source threshold voltage	$I_D = 1\text{ mA}; V_{GS} = V_{DS}$	0.4	–	1.8	V
$R_{DS(on)}$	drain-source on-resistance	$I_D = 100\text{ mA}; V_{GS} = 10\text{ V}$	–	8	15	$\Omega$
		$I_D = 100\text{ mA}; V_{GS} = 5\text{ V}$	–	12	20	$\Omega$
		$I_D = 10\text{ mA}; V_{GS} = 2.5\text{ V}$	–	18	30	$\Omega$
$ Y_{fs} $	transfer admittance	$I_D = 100\text{ mA}; V_{DS} = 10\text{ V}$	40	80	–	mS
$C_{iss}$	input capacitance	$V_{DS} = 10\text{ V}; V_{GS} = 0; f = 1\text{ MHz}$	–	8	15	pF
$C_{oss}$	output capacitance	$V_{DS} = 10\text{ V}; V_{GS} = 0; f = 1\text{ MHz}$	–	7	15	pF
$C_{rss}$	feedback capacitance	$V_{DS} = 10\text{ V}; V_{GS} = 0; f = 1\text{ MHz}$	–	2	5	pF
<b>Switching times</b>						
$t_{on}$	turn-on time	$I_D = 100\text{ mA}; V_{DD} = 20\text{ V}; V_{GS} = 0\text{ to }10\text{ V}$	–	2	5	ns
$t_{off}$	turn-off time	$I_D = 100\text{ mA}; V_{DD} = 50\text{ V}; V_{GS} = 0\text{ to }10\text{ V}$	–	5	10	ns



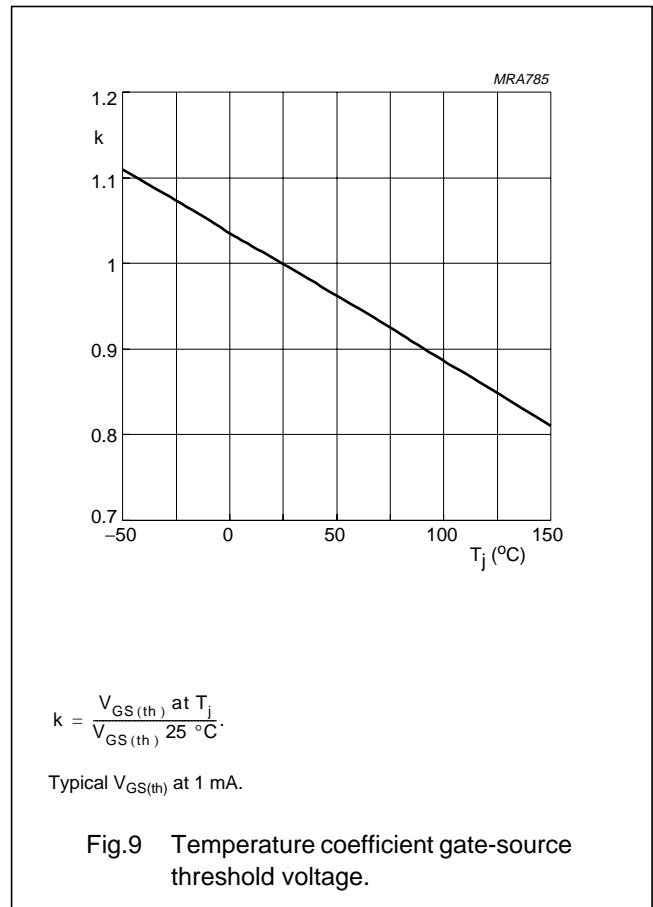
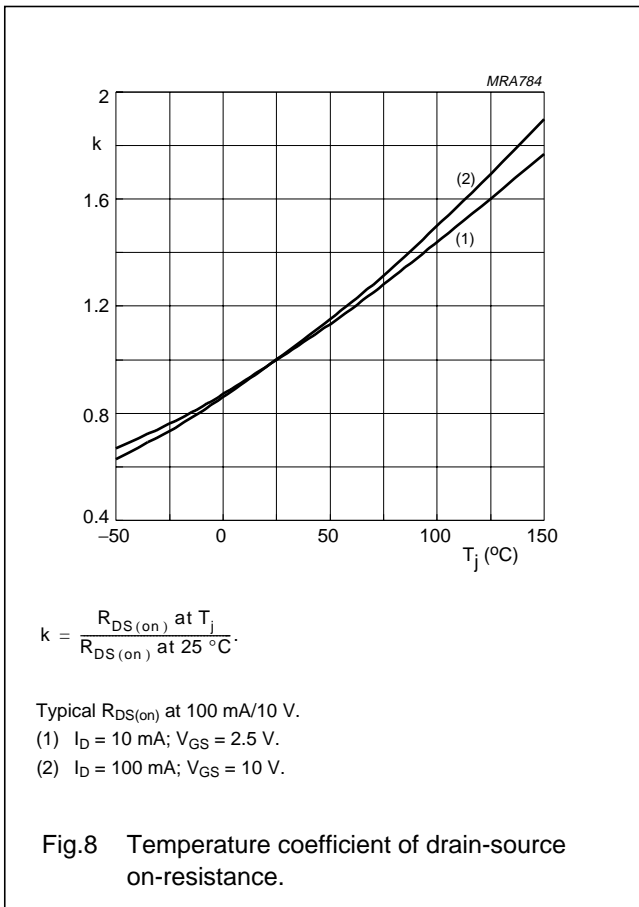
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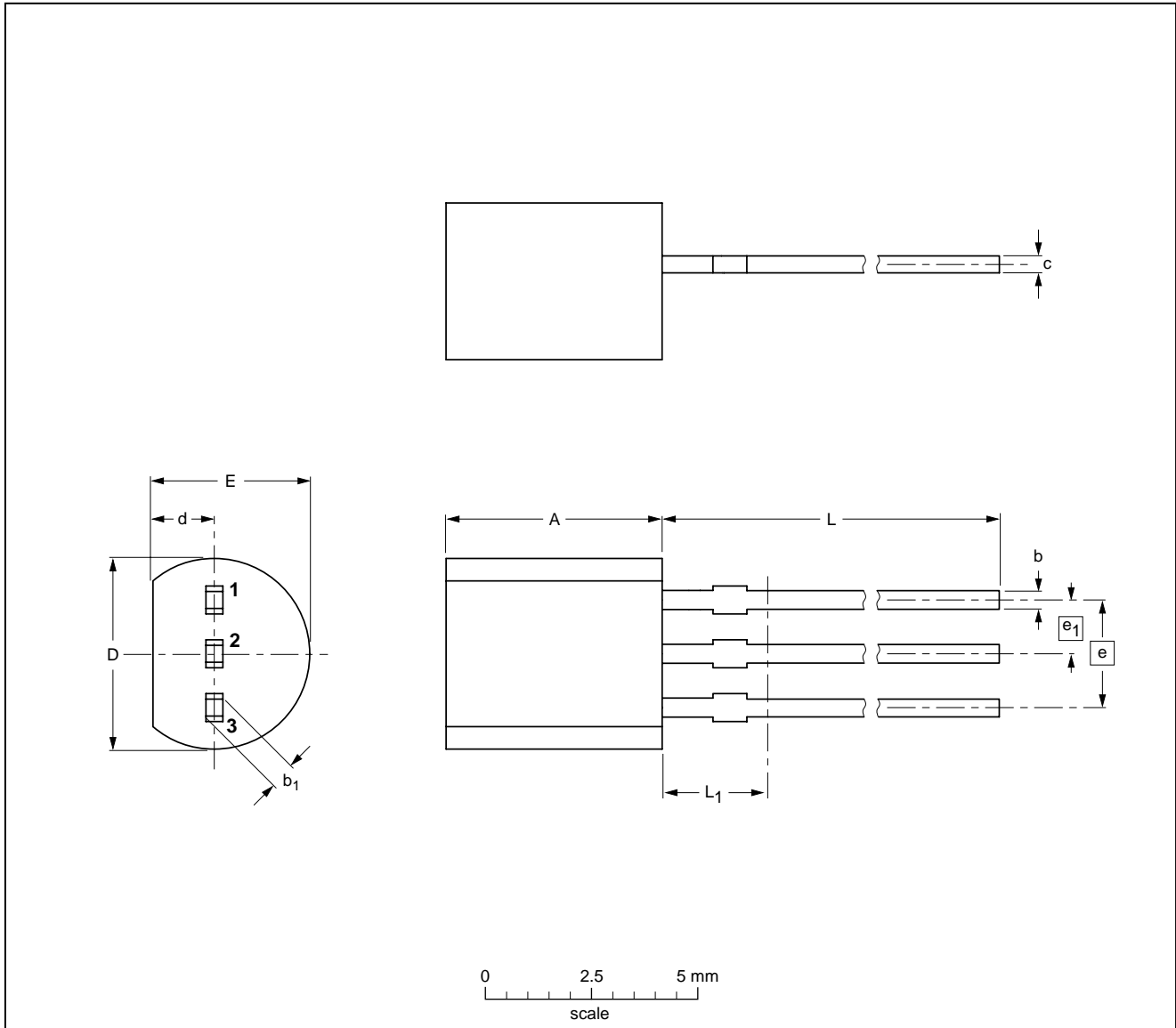
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PACKAGE OUTLINES

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

SOT54



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>
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

Note

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		TO-92	SC-43		97-02-28

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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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Printed in The Netherlands

137107/00/01/pp8

Date of release: April 1995

Document order number: 9397 750 02459

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