

DATA SHEET

BSP254; BSP254A P-channel enhancement mode vertical D-MOS transistor

Product specification
File under Discrete Semiconductors, SC13b

April 1995

P-channel enhancement mode vertical
D-MOS transistor

BSP254; BSP254A

FEATURES

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

DESCRIPTION

P-channel vertical D-MOS transistor in a TO-92 variant envelope and intended for use as a line current interruptor in relay, high-speed and line transformer drivers.

PINNING - TO-92 variant BSP254

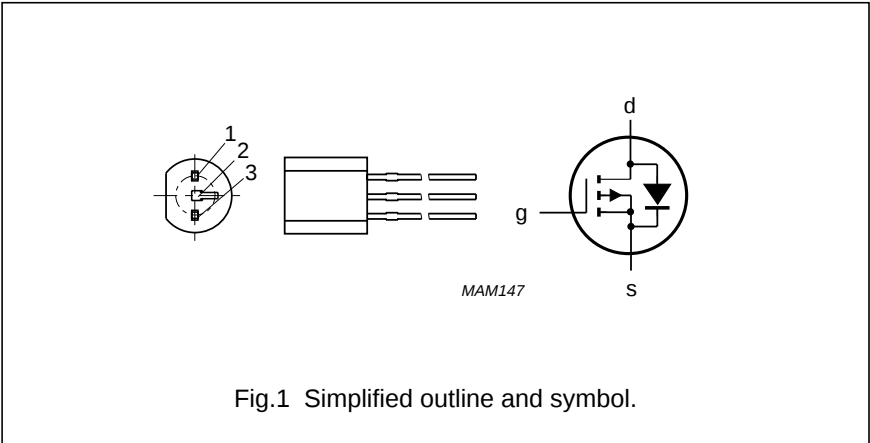
PIN	DESCRIPTION
1	gate
2	drain
3	source

PINNING - TO-92 variant BSP254A

PIN	DESCRIPTION
1	source
2	gate
3	drain

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{DS}	drain-source voltage		–	–	–250	V
V_{GSO}	gate-source voltage	open drain	–	–	±20	V
$ Y_{fs} $	forward transfer admittance	$I_D = -200\text{ mA};$ $V_{DS} = -25\text{ V}$	100	200	–	mS
I_D	drain current (DC)		–	–	–0.2	A
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = -10\text{ V};$ $I_D = -200\text{ mA}$	–	10	15	Ω
P_{tot}	total power dissipation	$T_{amb} = 25\text{ }^{\circ}\text{C}$	–	–	1	W



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LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$-V_{DS}$	drain-source voltage		–	250	V
V_{GSO}	gate-source voltage	open drain	–	20	V
$-I_D$	drain current	DC	–	0.2	A
$-I_{DM}$	drain current	peak value	–	0.6	A
P_{tot}	total power dissipation	$T_{amb} = 25\text{ }^{\circ}\text{C}$ (note 1)	–	1	W
T_{stg}	storage temperature range		–65	+150	$^{\circ}\text{C}$
T_j	junction temperature		–	150	$^{\circ}\text{C}$

THERMAL RESISTANCE

SYMBOL	PARAMETER	MAX.	UNIT
$R_{th\ j-a}$	from junction to ambient (note 1)	125	K/W

Note

- Transistor mounted on printed circuit board, maximum lead length 4 mm, mounting pad for drain lead minimum 10 mm x 10 mm.

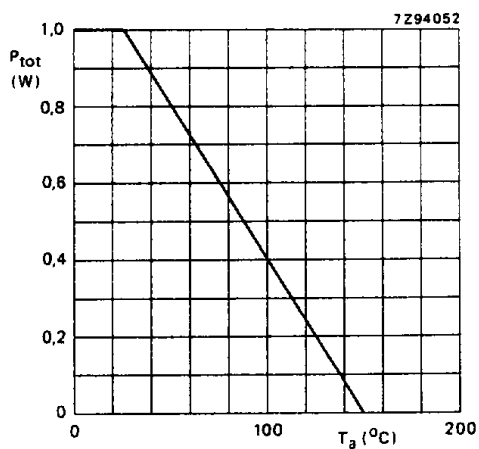


Fig.2 Power derating curve.

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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	$-V_{GS} = 0$ $-I_D = 10\text{ }\mu\text{A}$	250	—	—	V
$-I_{DSS}$	drain-source leakage current	$-V_{DS} = 200\text{ V}$ $V_{GS} = 0$	—	—	1	μA
$\pm I_{GSS}$	gate-source leakage current	$\pm V_{GS} = 20\text{ V}$ $V_{DS} = 0$	—	—	100	nA
$-V_{GS(th)}$	gate-source threshold voltage	$V_{GS} = V_{DS}$ $-I_D = 1\text{ mA}$	0.8	—	2.8	V
$R_{DS(on)}$	drain-source on-resistance	$-V_{GS} = 10\text{ V}$ $-I_D = 200\text{ mA}$	—	10	15	Ω
$ Y_{fs} $	transfer admittance	$-V_{DS} = 25\text{ V}$ $-I_D = 200\text{ mA}$	100	200	—	mS
C_{iss}	input capacitance	note 1	—	65	90	pF
C_{oss}	output capacitance	note 1	—	20	30	pF
C_{rss}	feedback capacitance	note 1	—	6	15	pF
t_{on}	turn-on time	note 2	—	5	10	ns
t_{off}	turn-off time	note 2	—	20	30	ns

Notes

1. Measured at $f = 1\text{ MHz}$; $-V_{DS} = 25\text{ V}$; $V_{GS} = 0$.
2. $-V_{GS} = 0$ to 10 V ; $-I_D = 250\text{ mA}$; $-V_{DD} = 50\text{ V}$.

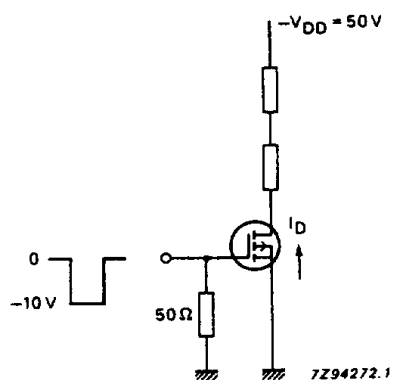


Fig.3 Switching times test circuit.

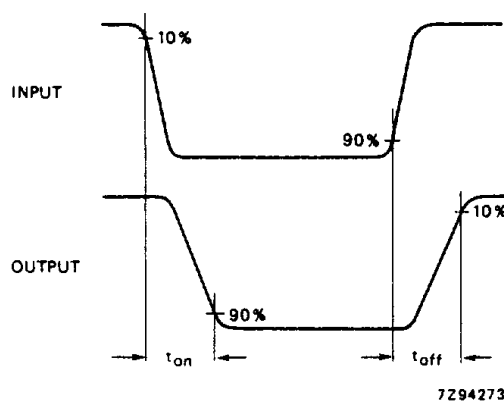
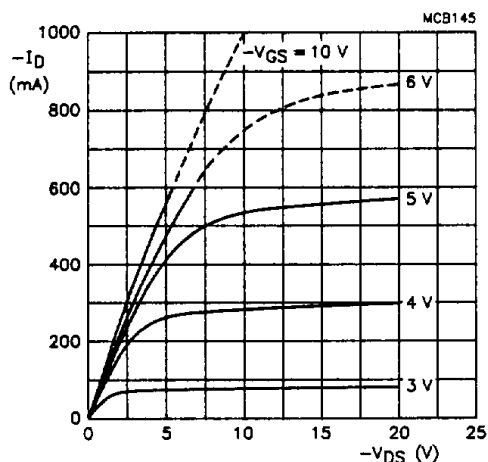
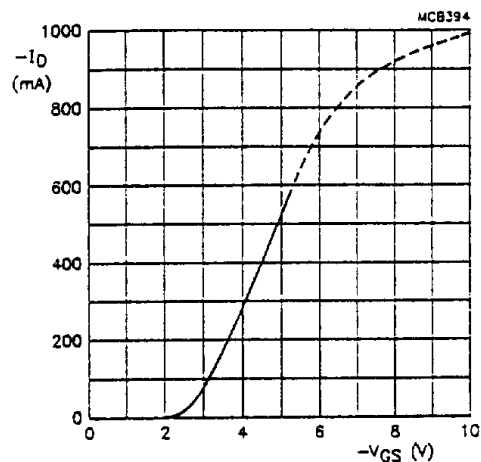
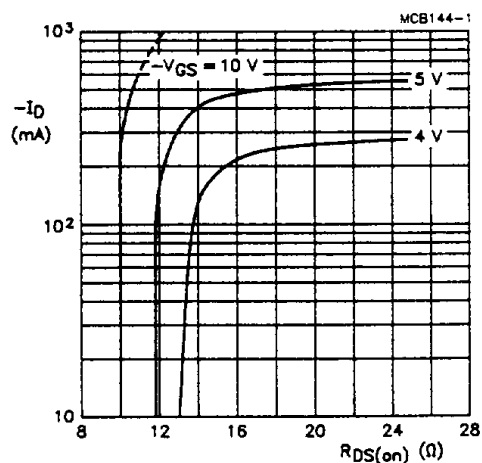
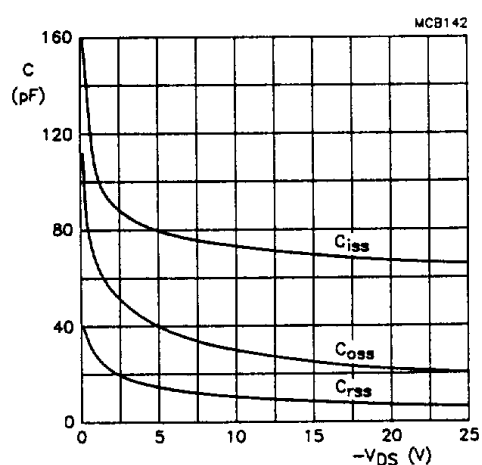


Fig.4 Input and output waveforms.

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Fig.5 Typical output characteristics; $T_j = 25\text{ }^{\circ}\text{C}$.Fig.6 Typical transfer characteristic; $V_{DS} = -10\text{ V}$; $T_j = 25\text{ }^{\circ}\text{C}$.Fig.7 Typical on-resistance as a function of drain current, $T_j = 25\text{ }^{\circ}\text{C}$.Fig.8 Typical capacitances as a function of drain-source voltage; $V_{GS} = 0$; $f = 1\text{ MHz}$; $T_j = 25\text{ }^{\circ}\text{C}$.

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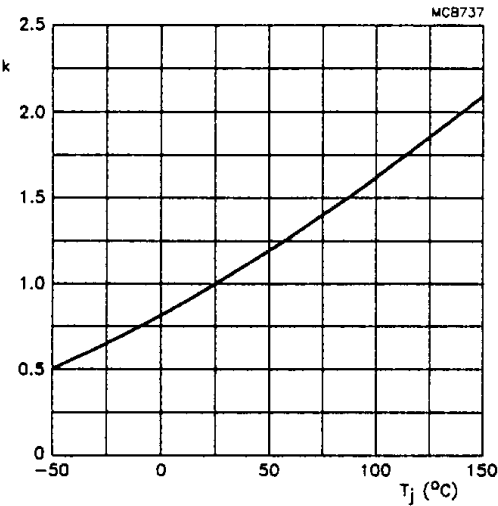


Fig.9

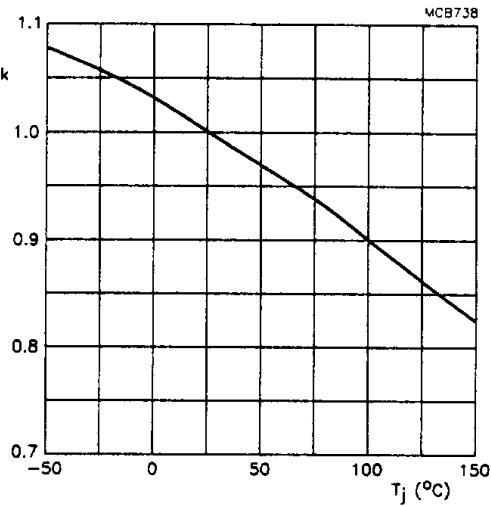


Fig.10

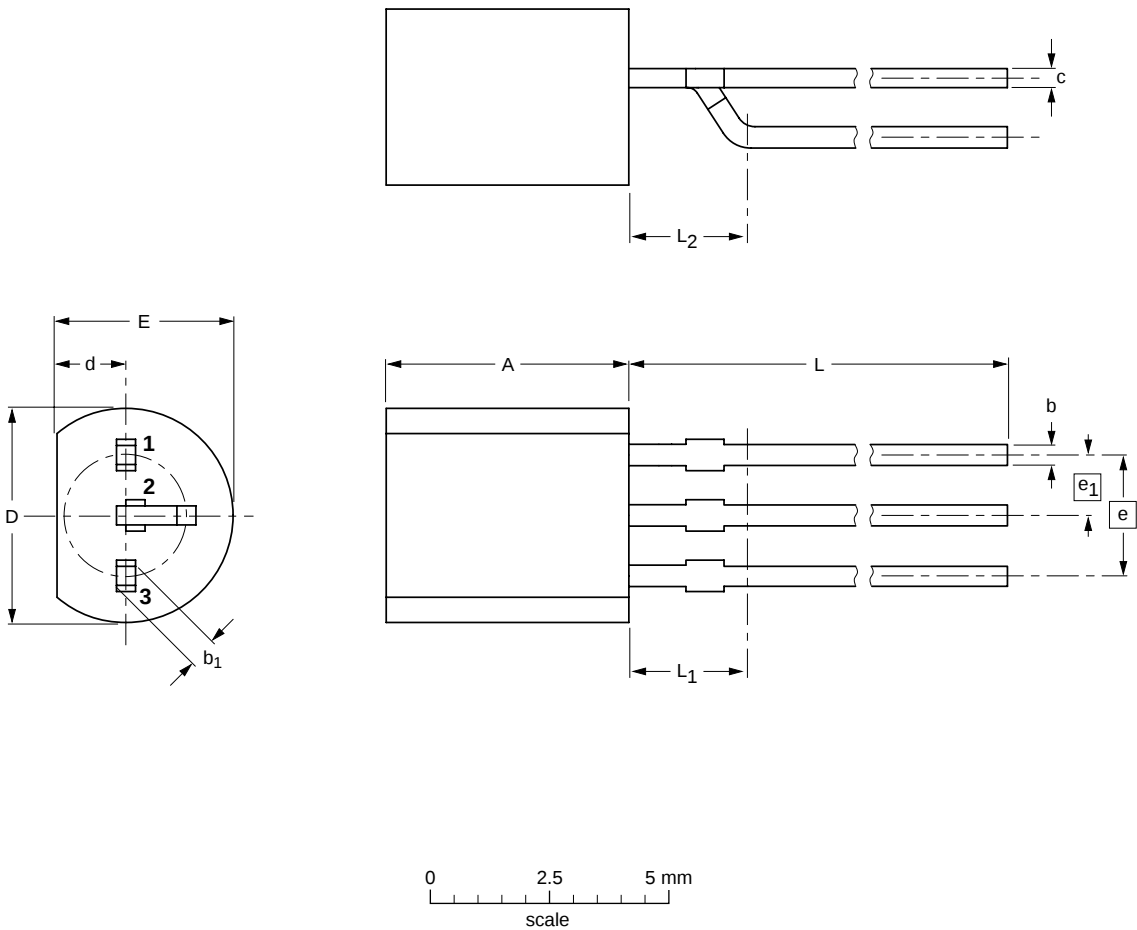
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PACKAGE OUTLINES

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

SOT54 variant



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾ max	L ₂ 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

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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NOTES

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Printed in The Netherlands

137107/00/01/pp12

Date of release: April 1995

Document order number: 9397 750 02484

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