

DATA SHEET

BS108

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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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 as a line current interruptor in telephone sets and for applications in relay, high-speed and line transformer drivers.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{DS}	drain-source voltage	200	V
I_D	DC drain current	250	mA
$R_{DS(on)}$	drain-source on-resistance	8	Ω
$V_{GS(th)}$	gate-source threshold voltage	1.8	V

PINNING

PIN	DESCRIPTION
1	source
2	gate
3	drain

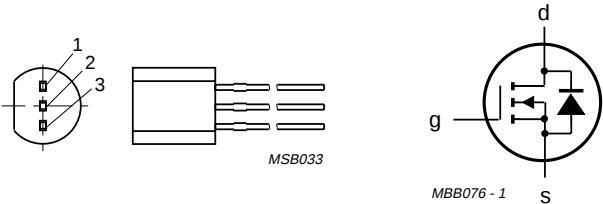


Fig.1 Simplified outline (TO-92) and symbol.

N-channel enhancement mode vertical D-MOS transistor

BS108

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage		–	200	V
$\pm V_{GSO}$	gate-source voltage	open drain	–	20	V
I_D	DC drain current		–	250	mA
I_{DM}	peak drain current		–	1	A
P_{tot}	total power dissipation	up to $T_{amb} = 25\text{ °C}$ (note 1)	–	1	W
T_{stg}	storage temperature range		–65	150	°C
T_j	junction temperature		–	150	°C

THERMAL RESISTANCE

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

Note

- Device mounted on a printed-circuit board, maximum lead length 4 mm; mounting pad for the drain lead minimum 10 × 10 mm

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$I_D = 10\text{ }\mu\text{A}$; $V_{GS} = 0$	200	–	–	V
I_{DSS}	drain-source leakage current	$V_{DS} = 160\text{ V}$; $V_{GS} = 0$	–	–	1	μA
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	$I_D = 100\text{ mA}$; $V_{GS} = 2.8\text{ V}$	–	5	8	Ω
$ Y_{fs} $	transfer admittance	$I_D = 300\text{ mA}$; $V_{DS} = 25\text{ V}$	200	400	–	mS
C_{iss}	input capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	–	50	80	pF
C_{oss}	output capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	–	20	30	pF
C_{rss}	feedback capacitance	$V_{DS} = 25\text{ V}$; $V_{GS} = 0$; $f = 1\text{ MHz}$	–	5	10	pF
Switching times (see Figs 2 and 2)						
t_{on}	turn-on time	$I_D = 250\text{ mA}$; $V_{DD} = 50\text{ V}$; $V_{GS} = 0\text{ to }10\text{ V}$	–	5	10	ns
t_{off}	turn-off time	$I_D = 250\text{ mA}$; $V_{DD} = 50\text{ V}$; $V_{GS} = 0\text{ to }10\text{ V}$	–	20	30	ns

N-channel enhancement mode vertical D-MOS transistor

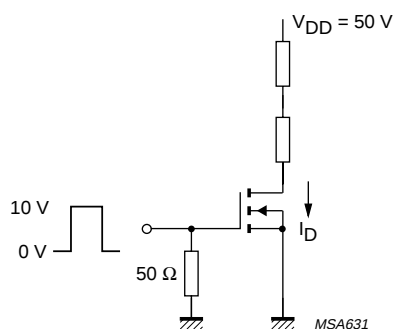
BS108 $V_{DD} = 50\text{ V}$

Fig.2 Switching times test circuit.

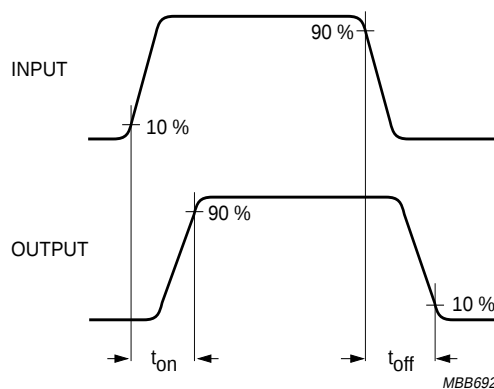


Fig.3 Input and output waveforms.

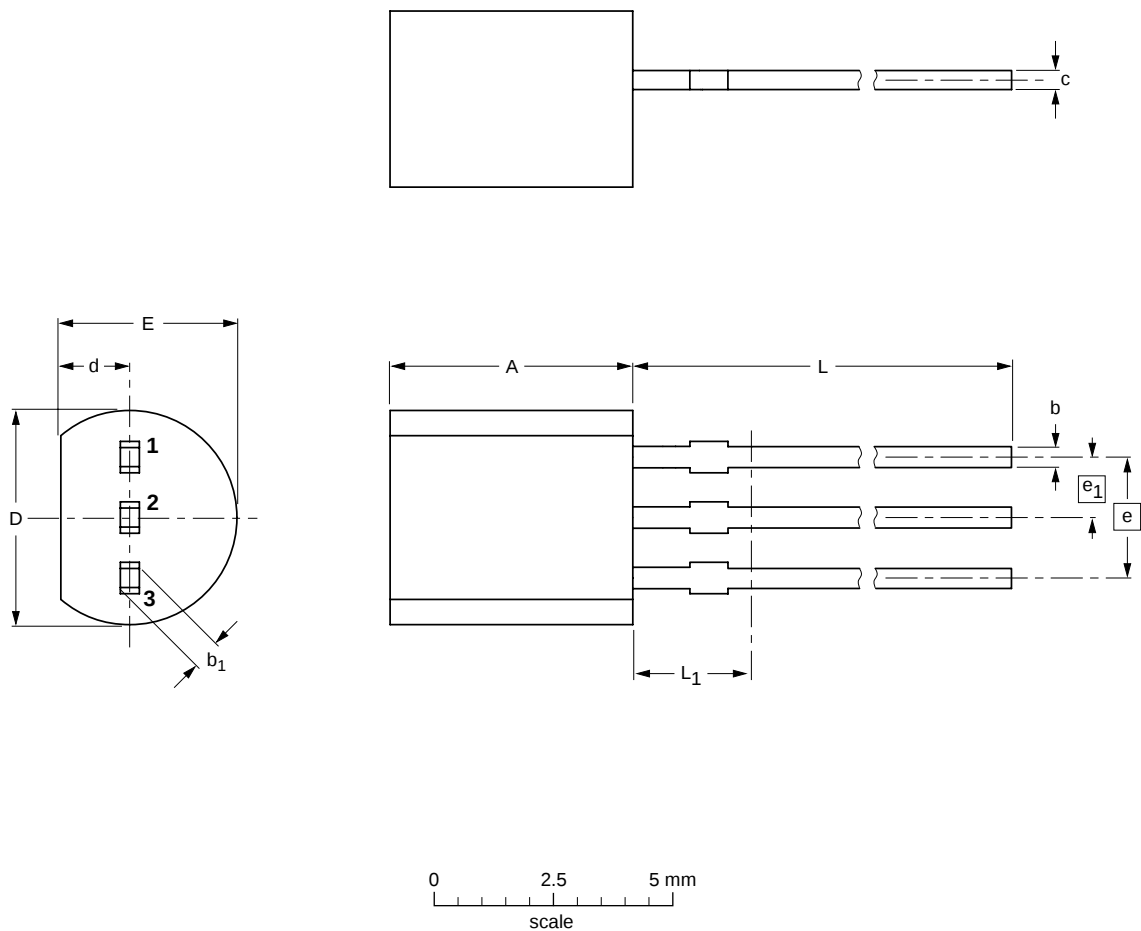
N-channel enhancement mode vertical
D-MOS transistor

BS108

PACKAGE OUTLINE

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

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾
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

N-channel enhancement mode vertical D-MOS transistor

BS108

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.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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N-channel enhancement mode vertical
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BS108

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SCA54

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