DATA SHEET

BS208
P-channel enhancement mode vertical D-MOS transistor

Product specification
File under Discrete Semiconductors, SC13b

April 1995

Philips
Semiconductors

PHILIPS

P-channel enhancement mode vertical D-MOS transistor

BS208

FEATURES

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

DESCRIPTION

P-channel enhancement mode vertical D-MOS transistor in a TO-92 envelope. Intended for use in relay, high-speed and line transformer drivers.

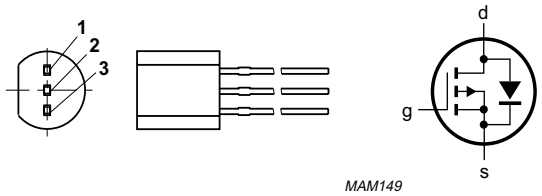

Fig.1 Simplified outline and symbol.

PINNING - TO-92

PIN	DESCRIPTION
1	source
2	gate
3	drain

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	–	–200	V
V_{GSO}	gate-source voltage (DC)	open drain	–	–	±20	V
$\lvert Y_{fs} \rvert$	forward transfer admittance	I_D = –200 mA; V_{DS} = –25 V	100	200	–	mS
I_D	drain current (DC)		–	–	–0.2	A
$R_{DS(on)}$	drain-source on-state resistance	V_{GS} = –10 V; I_D = –200 mA	–	10	14	Ω
P_{tot}	total power dissipation	T_{amb} = 25 °C	–	–	0.83	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		–	200	V
$\pm V_{GSO}$	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 °C	–	0.83	W
T_{stg}	storage temperature range		–65	+150	°C
T_j	junction temperature		–	150	°C

THERMAL RESISTANCE

SYMBOL	PARAMETER	MAX.	UNIT
$R_{thj\text{-}a}$	from junction to ambient	150	K/W

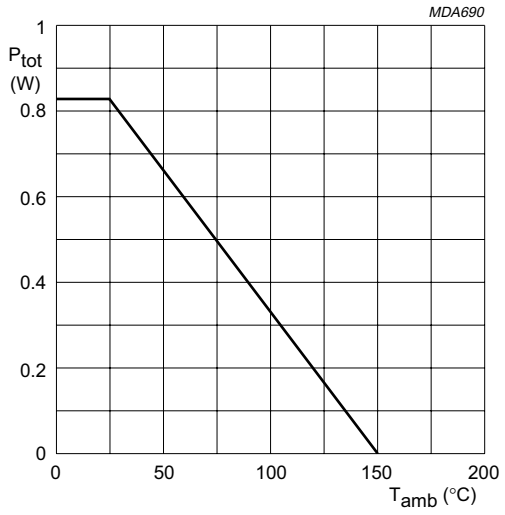

Fig.2 Power derating curve.

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CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$-V_{(BR)DSS}$	drain-source breakdown voltage	$-V_{GS}$ = 0 $-I_D$ = 10 μA	200	–	-	V
$-I_{DSS}$	drain-source leakage current	$-V_{DS}$ = 130 V V_{GS} = 0	–	–	1	μA
$-I_{DSS}$	drain-source leakage current	$-V_{DS}$ = 70 V $-V_{GS}$ = 0.2 V	–	–	25	μA
$-I_{GSS}$	gate-source leakage current	$-V_{GS}$ = 20 V V_{DS} = 0	–	–	100	nA
$-V_{GS(th)}$	gate-source threshold voltage	V_{GS} = V_{DS} $-I_D$ = 1 mA	0.8	–	2.8	V
$R_{DS(on)}$	drain-source on-resistance	$-V_{GS}$ = 10 V $-I_D$ = 200 mA	–	–	14	Ω
$\|Y_{fs}\|$	transfer admittance	$-V_{DS}$ = 25 V $-I_D$ = 200 mA	100	200	–	mS
C_{iss}	input capacitances	note 1	–	55	90	pF
C_{oss}	output capacitance	note 1	–	20	30	pF
C_{rss}	feedback capacitance	note 1	–	5	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 MHz; $-V_{DS}$ = 25 V; V_{GS} = 0.
2. $-V_{GS}$ = 0 to 10 V; $-I_D$ = 250 mA; $-V_{DD}$ = 50 V.

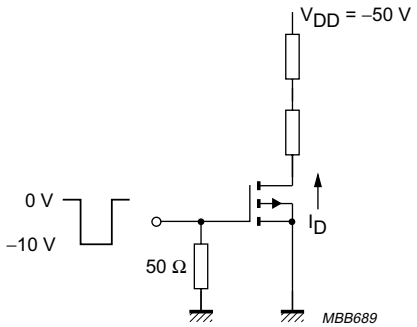


Fig.3 Switching times test circuit.

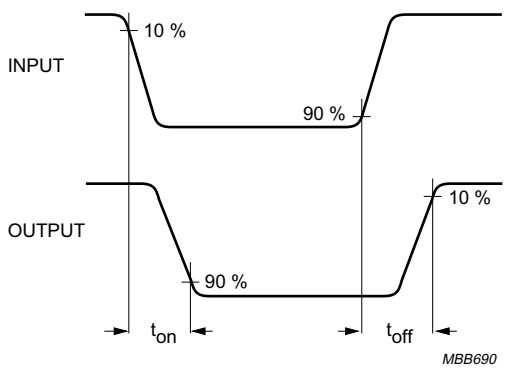


Fig.4 Input and output waveforms.

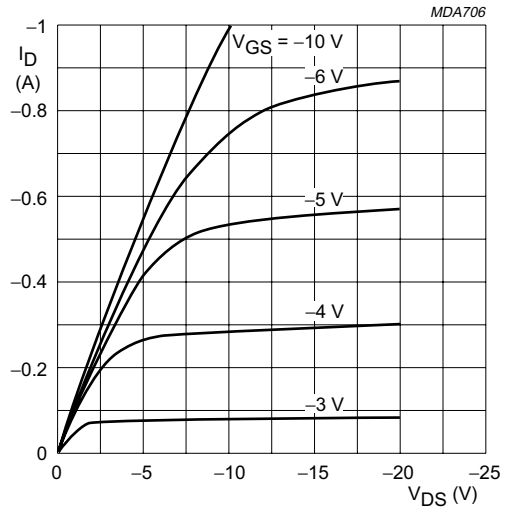


Fig.5 Typical output characteristics; T_j = 25 °C.

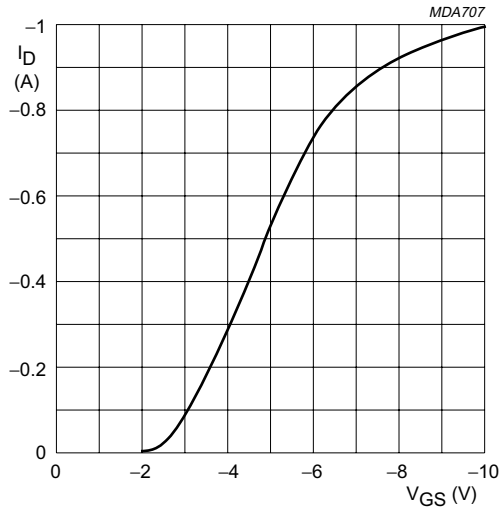


Fig.6 Typical transfer characteristics; V_{DS} = −10 V; T_j = 25 °C.

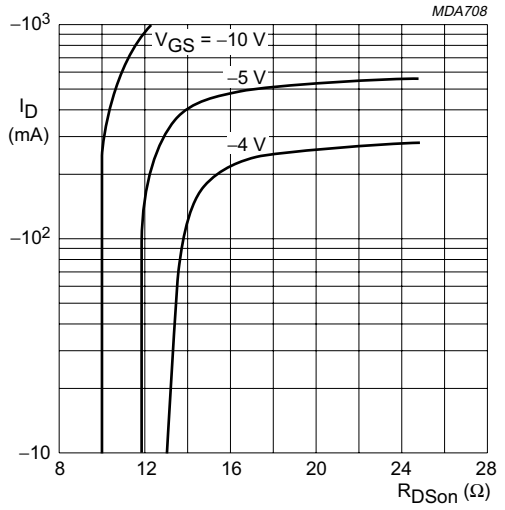


Fig.7 Typical on-resistance as a function of drain current; T_j = 25 °C.

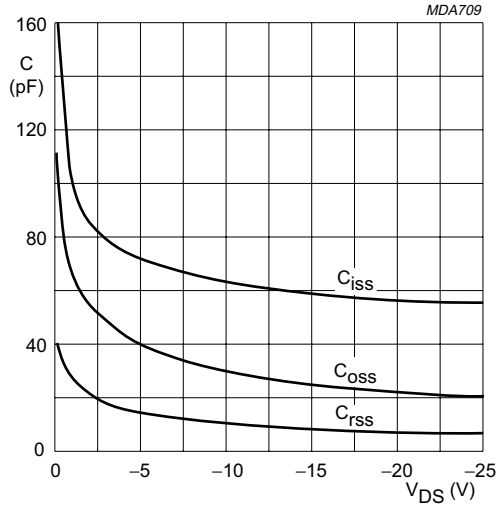


Fig.8 Typical capacitances as a function of drain-source voltage; V_{GS} = 0; f = 1 MHz; T_j = 25 °C.

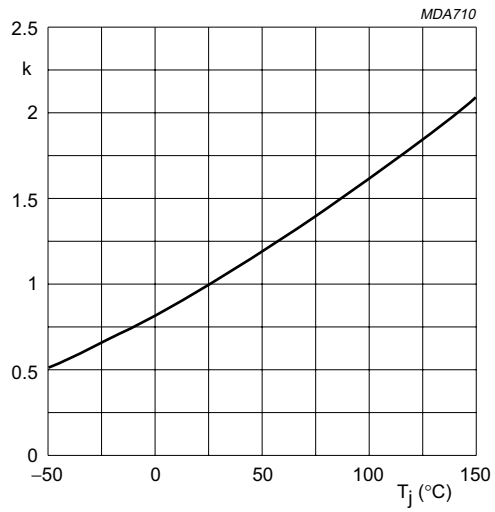


Fig.9 Temperature coefficient of drain-source on-resistance;

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

typical $R_{DS(on)}$ at 200 mA/10 V.

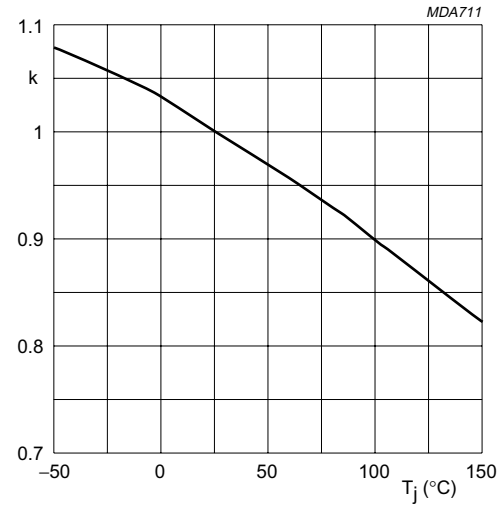


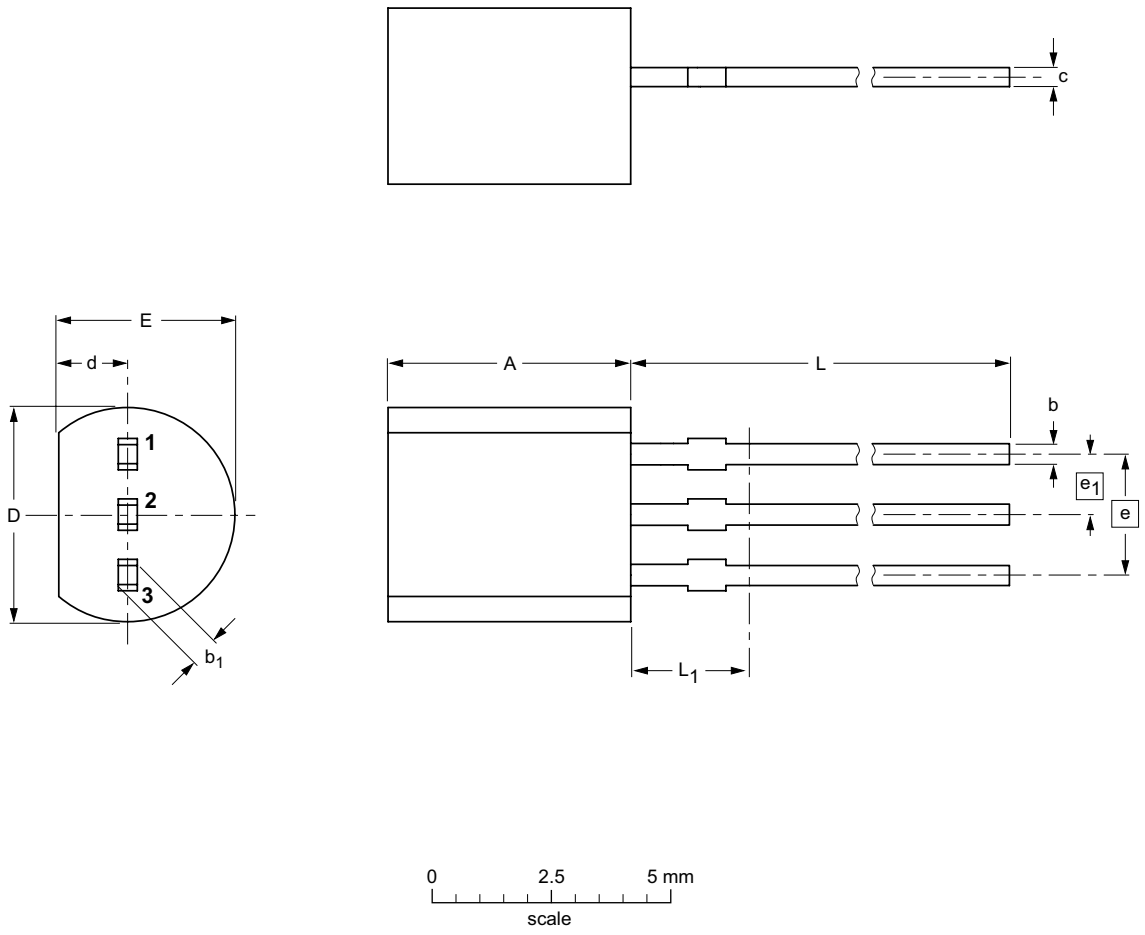
Fig.10 Temperature coefficient of gate-source threshold voltage;

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

typical VGS(th) at 1 mA.

PACKAGE OUTLINES

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

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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