DATA SHEET

BSP108
N-channel enhancement mode vertical D-MOS transistor

Product specification
File under Discrete Semiconductors, SC13b

April 1995

Philips
Semiconductors

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N-channel enhancement mode vertical D-MOS transistor

BSP108

DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a miniature SOT223 envelope and intended for use in relay, high-speed and line-transformer drivers.

FEATURES

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

PINNING - SOT223

1 = gate
2 = drain
3 = source
4 = drain

Marking code

BSP108

QUICK REFERENCE DATA

Drain-source voltage	V_{DS}	max.	80	V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20	V
Drain current (DC)	I_D	max.	500	mA
Total power dissipation up to T_{amb} = 25 °C	P_{tot}	max.	1.5	W
Drain-source ON-resistance				
I_D = 500 mA; V_{GS} = 10 V	$R_{DS(on)}$	typ.	2.0	Ω
		max.	3.0	Ω
Transfer admittance				
I_D = 500 mA; V_{DS} = 15 V	$\lvert Y_{fs} \rvert$	min.	150	mS
		typ.	300	mS

PIN CONFIGURATION

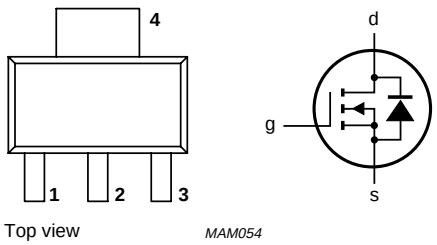


Fig.1 Simplified outline and symbol.

N-channel enhancement mode vertical D-MOS transistor

BSP108

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	V_{DS}	max.	80	V
Gate-source voltage (open drain)	$\pm V_{GSO}$	max.	20	V
Drain current (DC)	I_D	max.	500	mA
Drain current (peak)	I_{DM}	max.	1.0	A
Total power dissipation up to T_{amb} = 25 °C (note 1)	P_{tot}	max.	1.5	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)	$R_{th\ j\text{-}a}$	=	83.3	K/W

Note

1. Device mounted on an epoxy printed-circuit board 40 mm × 40 mm × 1.5 mm; mounting pad for the collector lead min. 6 cm^2.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Drain-source breakdown voltage				
I_D = 10 μA; V_{GS} = 0	$V_{(BR)\ DSS}$	min.	80	V
Gate threshold voltage				
I_D = 1 mA; V_{GS} = V_{DS}	$V_{GS\ (th)}$	min.	1.5	V
		max.	3.5	V
Gate-source leakage current				
$\pm V_{GS}$ = 20 V; V_{DS} = 0	I_{GSS}	max.	100	nA
Drain-source leakage current				
V_{DS} = 60 V; V_{GS} = 0	I_{DSS}	max.	1.0	μA
Drain-source ON-resistance				
I_D = 500 mA; V_{GS} = 10 V	$R_{DS(on)}$	typ.	2.0	Ω
		max.	3.0	Ω
Transfer admittance				
I_D = 500 mA; V_{DS} = 15 V	$\lvert Y_{fs} \rvert$	min.	150	mS
		typ.	300	mS
Input capacitance at f = 1 MHz;				
V_{DS} = 10 V; V_{GS} = 0	C_{iss}	typ.	45	pF
		max.	60	pF
Output capacitance at f = 1 MHz;				
V_{DS} = 10 V; V_{GS} = 0	C_{oss}	typ.	30	pF
		max.	45	pF

Feedback capacitance at f = 1 MHz; V_{DS} = 10 V; V_{GS} = 0	C_{rss}	typ.	8 pF
		max.	12 pF
Switching times (see Figs 2 and 3)			
I_D = 500 mA; V_{DD} = 50 V; V_{GS} = 0 to 10 V	t_{on}	typ.	4 ns
		max.	8 ns
	t_{off}	typ.	10 ns
		max.	15 ns

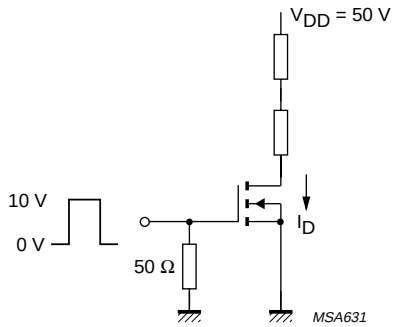


Fig.2 Switching times test circuit.

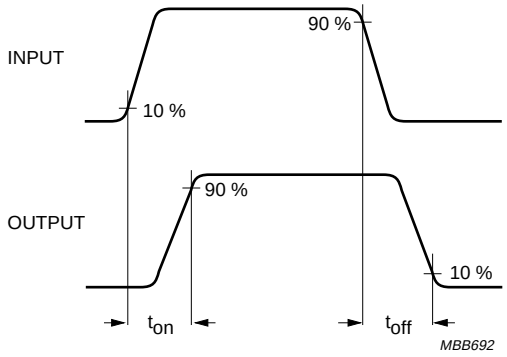


Fig.3 Input and output waveforms.

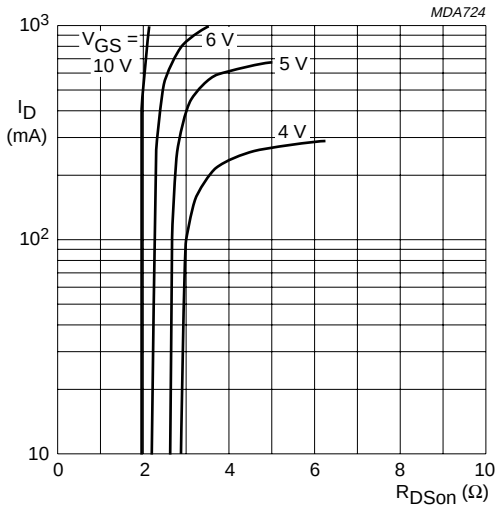


Fig.4 T_j = 25 °C; typical values.

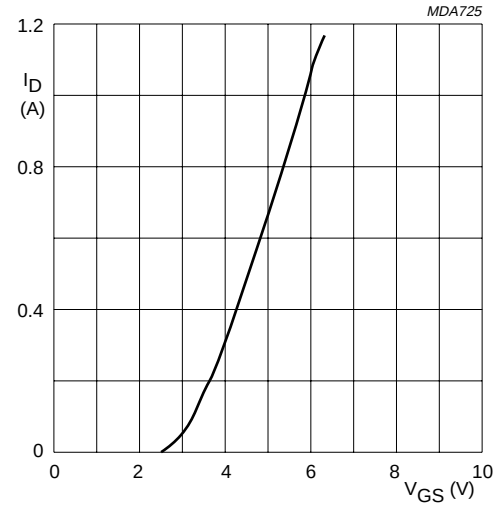


Fig.5 T_j = 25 °C; typical values at V_{DS} = 10 V.

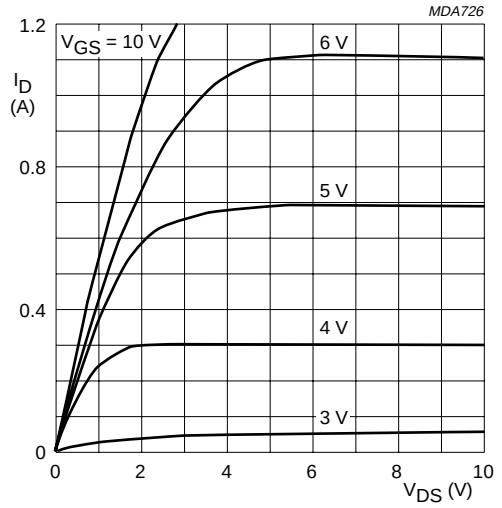


Fig.6 T_j = 25 °C; typical values.

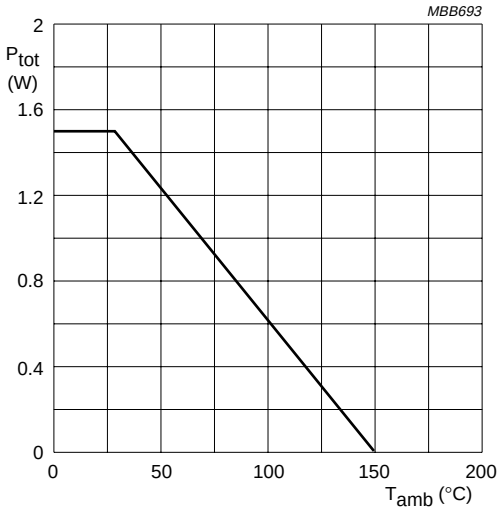


Fig.7 Power derating curve.

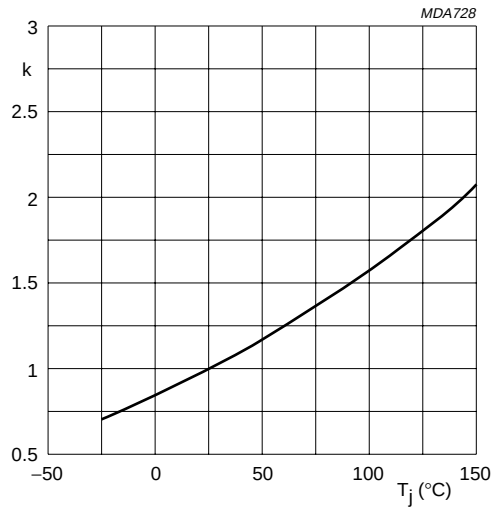


Fig.8

$$k = \frac{R_{DS\,on} \text{ at } T_j}{R_{DS\,on} \text{ at } 25\ °C};$$

typical values at 500 mA/10 V.

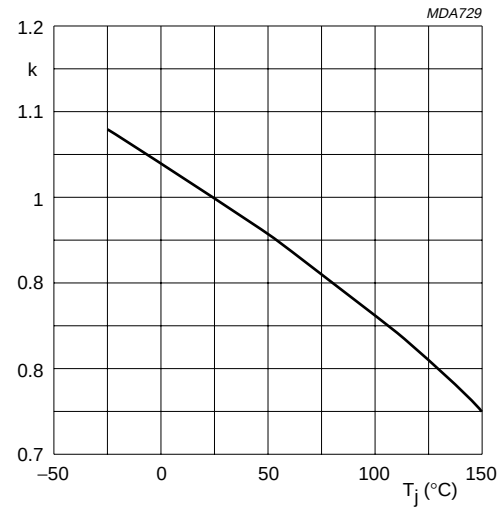


Fig.9

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

$V_{GS(th)}$ at 1 mA; typical values.

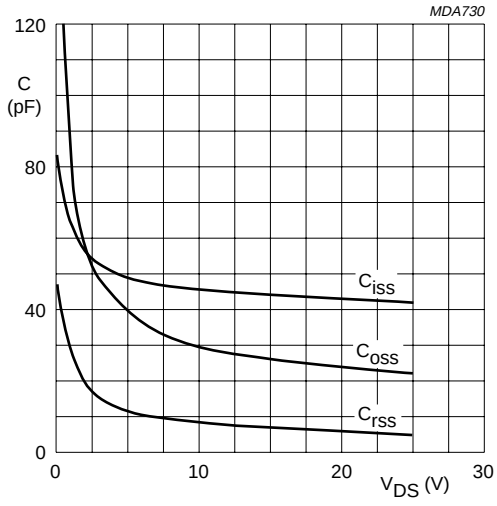
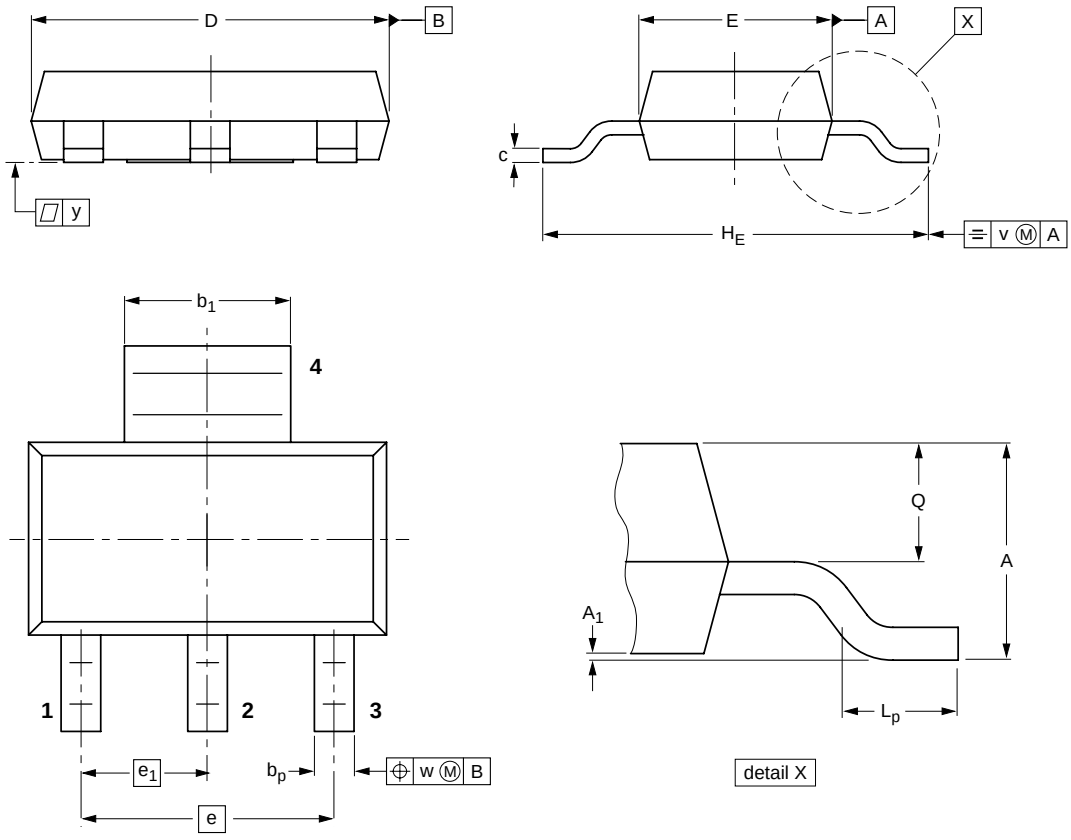


Fig.10 T_j = 25 °C; V_{GS} = 0; f = 1 MHz; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads **SOT223**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b_p	b_1	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.8 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223						~~96-11-11~~ 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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