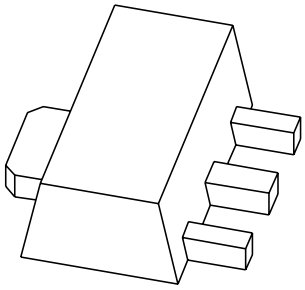
DATA SHEET



BSS192
P-channel enhancement mode vertical D-MOS transistor

Product specification
Supersedes data of 1997 Jun 20

2002 May 22

Philips
Semiconductors

PHILIPS

P-channel enhancement mode vertical D-MOS transistor

BSS192

FEATURES

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

APPLICATIONS

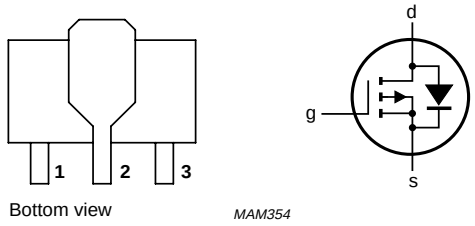
- Line current interrupter in telephone sets
- Relay, high-speed and line transformer drivers.

DESCRIPTION

P-channel enhancement mode vertical D-MOS transistor in a SOT89 package.

PINNING - SOT89

PIN	SYMBOL	DESCRIPTION
1	s	source
2	d	drain
3	g	gate



Bottom view

Marking code: KB.

Fig.1 Simplified outline and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–240	V
V_{GSth}	gate-source threshold voltage	I_D = –1 mA; V_{GS} = V_{DS}	–2.8	V
I_D	drain current (DC)		–200	mA
R_{DSon}	drain-source on-state resistance	I_D = –200 mA; V_{GS} = –10 V	12	Ω

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage (DC)		–	–240	V
V_{GSO}	gate-source voltage (DC)	open drain	–	±20	V
I_D	drain current (DC)		–	–200	mA
I_{DM}	peak drain current		–	–600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	1	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on a ceramic substrate; area 2.5 cm^2; thickness 0.7 mm.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	125	K/W

Note

1. Device mounted on a ceramic substrate; area 2.5 cm^2; thickness 0.7 mm.

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	–240	–	–	V
V_{GSth}	gate-source threshold voltage	$V_{GS} = V_{DS}$; I_D = –1 mA	–0.8	–	–2.8	V
I_{DSS}	drain-source leakage current	V_{GS} = 0; V_{DS} = –60 V	–	–	–200	nA
		V_{GS} = –0.2 V; V_{DS} = –200 V	–	–0.1	–60	μA
I_{GSS}	gate leakage current	V_{DS} = 0; V_{GS} = ±20 V	–	–	±100	nA
R_{DSon}	drain-source on-state resistance	V_{GS} = –10 V; I_D = –200 mA	–	10	12	Ω
$\lvert y_{fs} \rvert$	forward transfer admittance	V_{DS} = –25 V; I_D = –200 mA	60	200	–	mS
C_{iss}	input capacitance	V_{GS} = 0; V_{DS} = –25 V; f = 1 MHz	–	55	90	pF
C_{oss}	output capacitance	V_{GS} = 0; V_{DS} = –25 V; f = 1 MHz	–	20	30	pF
C_{rss}	reverse transfer capacitance	V_{GS} = 0; V_{DS} = –25 V; f = 1 MHz	–	5	15	pF
Switching times (see Figs 2 and 3)						
t_{on}	turn-on time	V_{GS} = 0 to –10 V; V_{DD} = –50 V; I_D = –250 mA	–	5	10	ns
t_{off}	turn-off time	V_{GS} = –10 to 0 V; V_{DD} = –50 V; I_D = –250 mA	–	20	30	ns

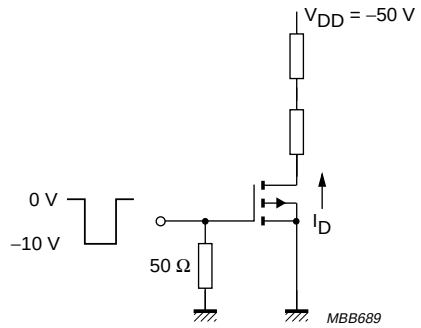


Fig.2 Switching times test circuit.

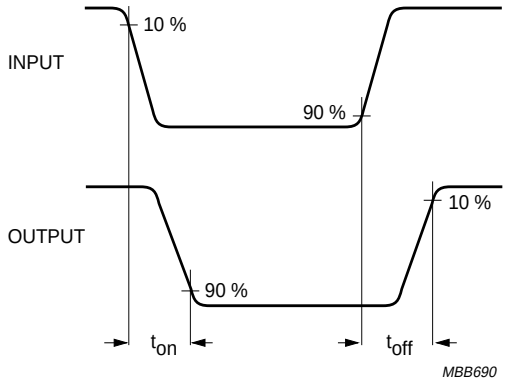


Fig.3 Input and output waveforms.

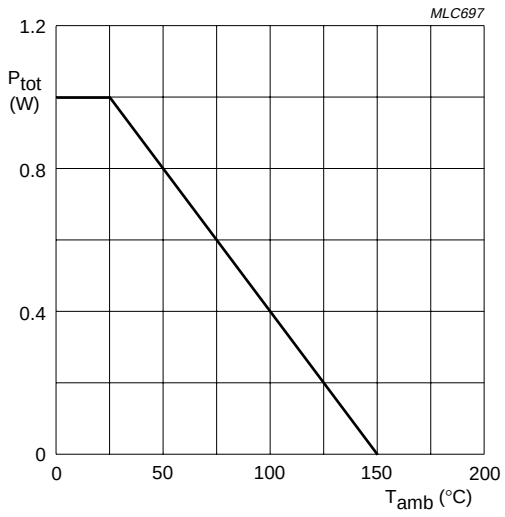
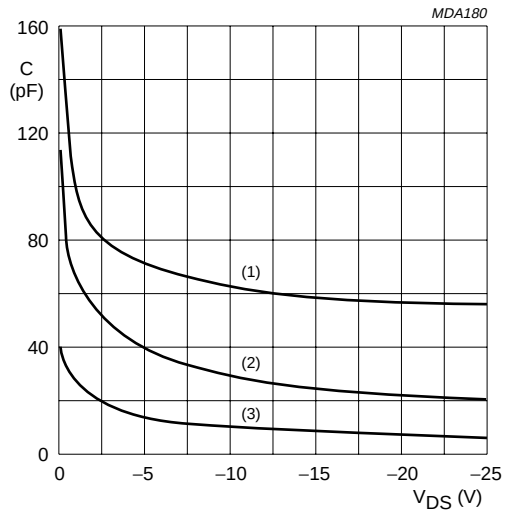
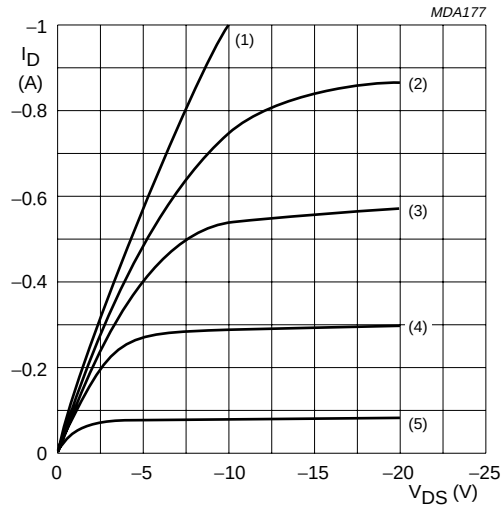


Fig.4 Power derating curve.



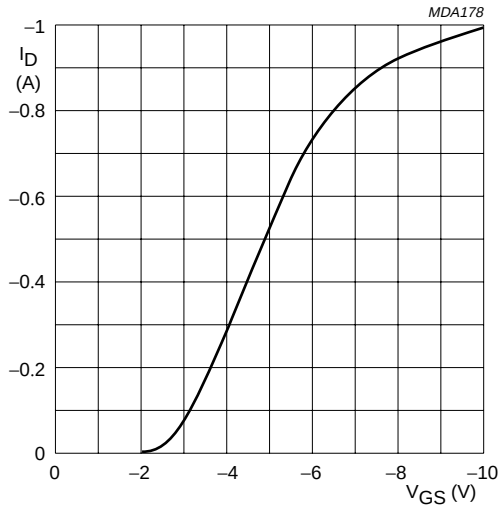
V_{GS} = 0; T_j = 25 °C; f = 1 MHz.
(1) C_{iss}.
(2) C_{oss}.
(3) C_{rss}.

Fig.5 Capacitance as a function of drain-source voltage; typical values.



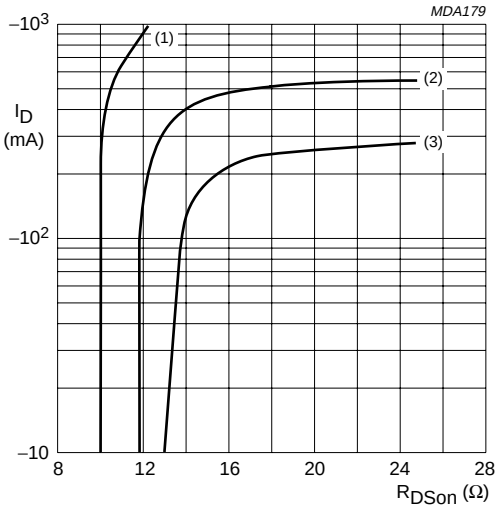
T_j = 25 °C.
(1) V_{GS} = −10 V.
(2) V_{GS} = −6 V.
(3) V_{GS} = −5 V.
(4) V_{GS} = −4 V.
(5) V_{GS} = −3 V.

Fig.6 Output characteristics; typical values.



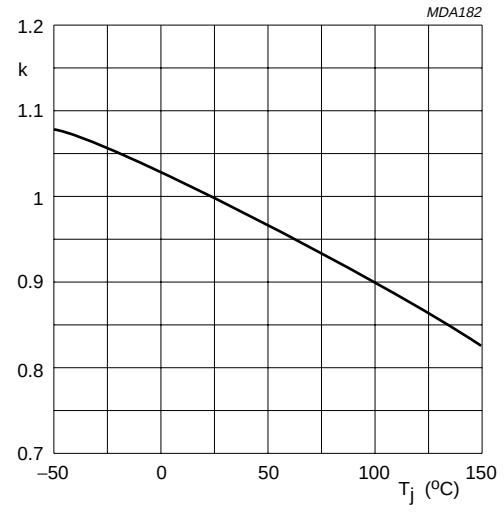
V_{DS} = −10 V; T_j = 25 °C.

Fig.7 Transfer characteristic; typical values.



T_j = 25 °C.
(1) V_{GS} = −10 V.
(2) V_{GS} = −5 V.
(3) V_{GS} = −4 V.

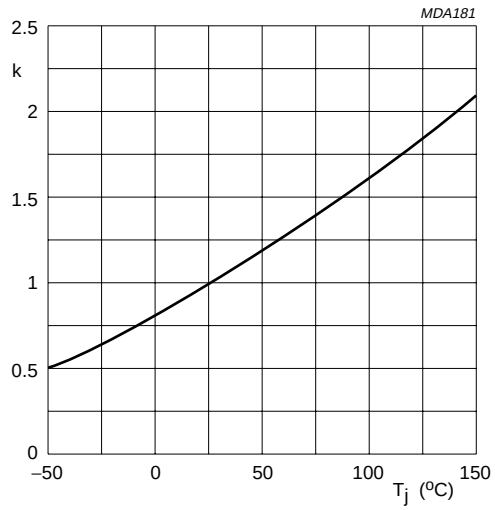
Fig.8 Drain current as a function of drain-source on-state resistance; typical values.



$$k = \frac{V_{GSth} \text{ at } T_j}{V_{GSth} \text{ at } 25°C}$$

V_{GSth} at I_D = −1 mA.

Fig.9 Temperature coefficient of gate-source threshold voltage; typical values.



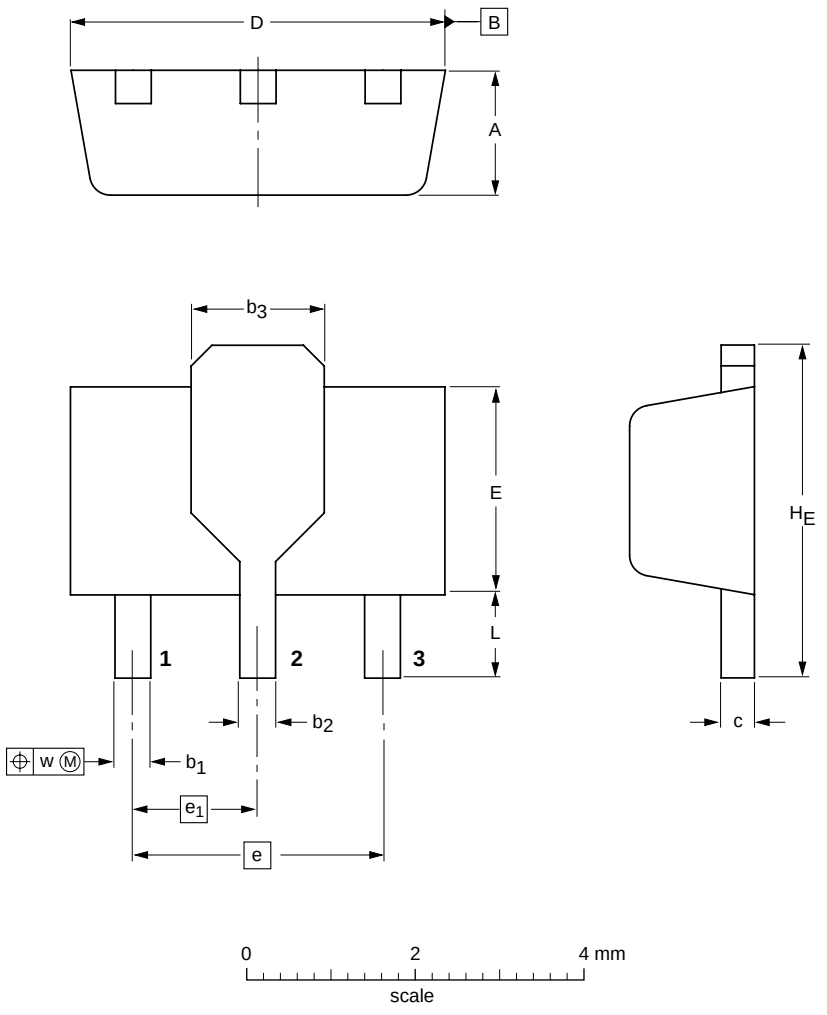
$$k = \frac{R_{DSon} \text{ at } T_j}{R_{DSon} \text{ at } 25\ °C}$$

I_D = –200 mA; V_{GS} = –10 V.

Fig.10 Temperature coefficient of drain-source on-state resistance; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 3 leads **SOT89**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_1	b_2	b_3	c	D	E	e	e_1	H_E	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89		TO-243	SC-62			~~97-02-28~~ 99-09-13

DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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 — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

DISCLAIMERS

Life support applications — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes, without notice, in the products, including circuits, standard cells, and/or software, described or contained herein in order to improve design and/or performance. Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

NOTES

NOTES

NOTES

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit **http://www.semiconductors.philips.com**. Fax: **+31 40 27 24825**
For sales offices addresses send e-mail to: **sales.addresses@www.semiconductors.philips.com**.

Printed in The Netherlands 613510/03/pp12 Date of release: 2002 May 22 Document order number: 9397 750 09633

Let's make things better.

Philips
Semiconductors

PHILIPS