# DATA SHEET

# BST122
## P-channel enhancement mode vertical D-MOS transistor

Product specification
File under Discrete Semiconductors, SC13b

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Philips Semiconductors

PHILIPS

# P-channel enhancement mode vertical D-MOS transistor

# BST122

## DESCRIPTION

P-channel vertical D-MOS transistor in SOT89 envelope and intended for use in relay, high-speed and line-transformer drivers, using SMD-technology.

## FEATURES

- Very low $R_{DS(on)}$
- Direct interface to C-MOS, TTL
- High-speed switching
- No second breakdown

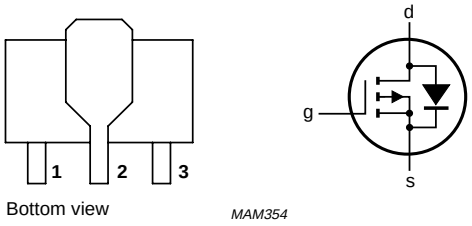
## QUICK REFERENCE DATA

| | | | | |
|---|---|---|---|---|
| Drain-source voltage | $-V_{DS}$ | max. | 60 | V |
| Gate-source voltage (open drain) | $\pm V_{GSO}$ | max. | 20 | V |
| Drain current (DC) | $-I_D$ | max. | 0,25 | A |
| Total power dissipation up to $T_{amb}$ = 25 °C | $P_{tot}$ | max. | 1 | W |
| Drain-source ON-resistance | | | | |
| $-I_D$ = 200 mA; $-V_{GS}$ = 10 V | $R_{DS(on)}$ | max.<br>typ. | 10<br>7.5 | Ω<br>Ω |
| Transfer admittance | | | | |
| $-I_D$ = 200 mA; $-V_{DS}$ = 15 V | $\lvert Y_{fs} \rvert$ | typ. | 125 | mS |

## PINNING - SOT89

1 = source
2 = drain
3 = gate

## PIN CONFIGURATION




Marking: LN

Fig.1 Simplified outline and symbol.

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## RATINGS

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

| | | | | |
|---|---|---|---|---|
| Drain-source voltage | $-V_{DS}$ | max. | 60 | V |
| Gate-source voltage (open drain) | $\pm V_{GSO}$ | max. | 20 | V |
| Drain current (DC) | $-I_D$ | max. | 0.25 | A |
| Drain current (peak) | $-I_{DM}$ | max. | 0.5 | A |
| Total power dissipation up to $T_{amb}$ = 25 °C | $P_{tot}$ | max. | 1 | 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) | $R_{th\ j\text{-}a}$ | = | 125 | K/W |

**Note**

1. Transistor mounted on a ceramic substrate: area = 2,5 $cm^2$; thickness = 0,7 mm.

## CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified

| | | | | |
|---|---|---|---|---|
| Drain-source breakdown voltage | | | | |
| $-I_D$ = 10 μA; $V_{GS}$ = 0 | $-V_{(BR)DSS}$ | min. | 60 | V |
| Drain-source leakage current | | | | |
| $-V_{DS}$ = 48 V; $V_{GS}$ = 0 | $-I_{DSS}$ | max. | 1 | μA |
| Gate-source leakage current | | | | |
| $-V_{GS}$ = 20 V; $V_{DS}$ = 0 | $-I_{GSS}$ | max. | 100 | nA |
| Gate threshold voltage | | | | |
| $-I_D$ = 1 mA; $V_{DS}$ = $V_{GS}$ | $-V_{GS(th)}$ | min. | 1.5 | V |
| | | max. | 3.5 | V |
| Drain-source ON-resistance | | | | |
| $-I_D$ = 200 mA; $-V_{GS}$ = 10 V | $R_{DS(on)}$ | max. | 10 | Ω |
| | | typ. | 7.5 | Ω |
| Transfer admittance | | | | |
| $-I_D$ = 200 mA; $-V_{DS}$ = 15 V | $\lvert Y_{fs} \rvert$ | typ. | 125 | mS |
| Input capacitance at f = 1 MHz | | | | |
| $-V_{DS}$ = 10 V; $V_{GS}$ = 0 | $C_{iss}$ | typ. | 30 | pF |
| | | max. | 45 | pF |
| Output capacitance at f = 1 MHz | | | | |
| $-V_{DS}$ = 10 V; $V_{GS}$ = 0 | $C_{oss}$ | typ. | 20 | pF |
| | | max. | 30 | pF |
| Feedback capacitance at f = 1 MHz | | | | |
| $-V_{DS}$ = 10 V; $V_{GS}$ = 0 | $C_{rss}$ | typ. | 5 | pF |
| | | max. | 10 | pF |
| Switching times (see Figs 2 and 3) | | | | |
| $-I_D$ = 200 mA; $-V_{DD}$ = 50 V; $-V_{GS}$ = 0 to 10 V | $t_{on}$ | typ. | 4 | ns |
| | $t_{off}$ | typ. | 10 | ns |

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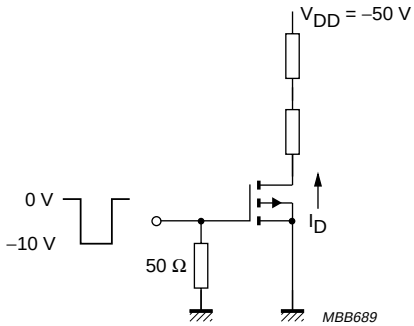



Fig.2 Switching times test circuit.

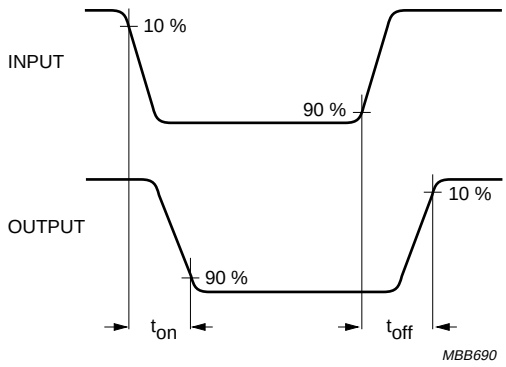



Fig.3 Input and output waveforms.

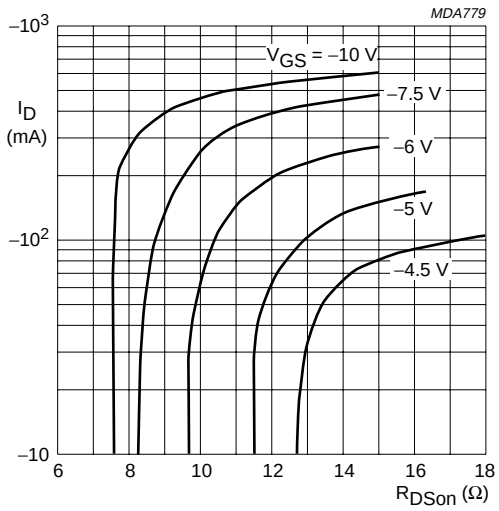



Fig.4 Drain current vs ON-resistance; $T_j$ = 25 °C; typical values.

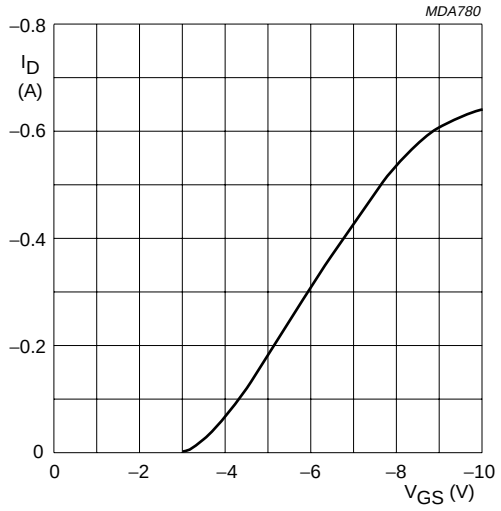



Fig.5 Transfer characteristics; $T_j$ = 25 °C; $-V_{DS}$ = 10 V; typical values.

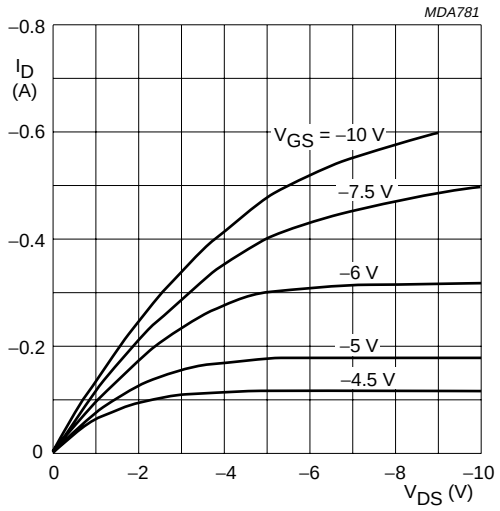
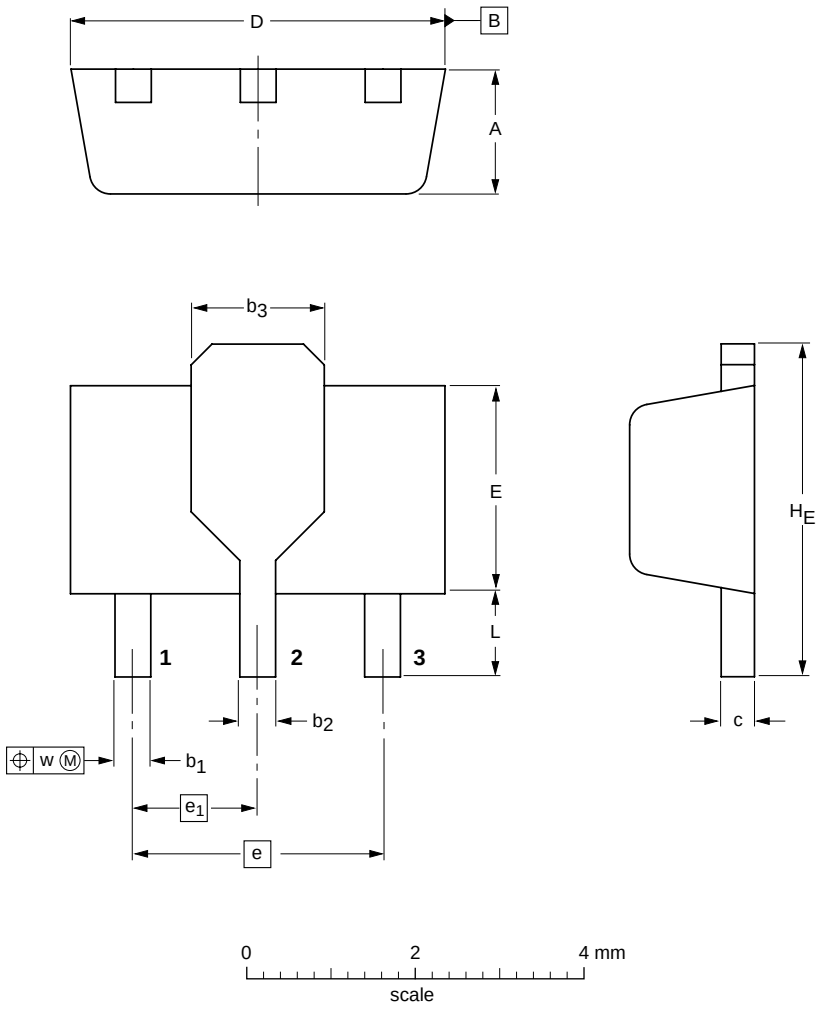



Fig.6 Output characteristics; $T_j$ = 25 °C; typical values.

## PACKAGE OUTLINES

**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<br>1.4 | 0.48<br>0.35 | 0.53<br>0.40 | 1.8<br>1.4 | 0.44<br>0.37 | 4.6<br>4.4 | 2.6<br>2.4 | 3.0 | 1.5 | 4.25<br>3.75 | 0.8 | 0.13 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT89 | | | | | | 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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