

# DATA SHEET

## **BSP205**

P-channel enhancement mode  
vertical D-MOS transistor

Product specification  
File under Discrete Semiconductors, SC13b

April 1995

# P-channel enhancement mode vertical D-MOS transistor

**BSP205**

**DESCRIPTION**

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

**QUICK REFERENCE DATA**

|   |               |      |             |
|---|---------------|------|-------------|
| Drain-source voltage  | $-V_{DS}$     | max. | 60 V        |
| Drain current (DC)  | $-I_D$        | max. | 275 mA      |
| Drain-source ON-resistance<br>$-I_D = 200 \text{ mA}; -V_{GS} = 10 \text{ V}$ | $R_{DS(on)}$  | max. | 10 $\Omega$ |
| Gate threshold voltage  | $-V_{GS(th)}$ | max. | 3.5 V       |

**FEATURES**

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

**PINNING - SOT223**

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

**PIN CONFIGURATION**

**Marking code**

BSP205

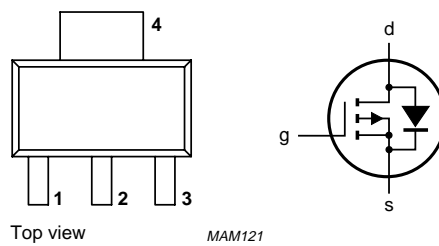


Fig.1 Simplified outline and symbol.

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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. | 275 mA        |
| Drain current (peak)  | $-I_{DM}$     | max. | 550 mA        |
| Total power dissipation up to $T_{amb} = 25\text{ °C}$ (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) | $R_{th\ j-a}$ | = | 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 drain lead min. 6 cm<sup>2</sup>.

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### CHARACTERISTICS

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

Drain-source breakdown voltage

$-I_D = 10\text{ }\mu\text{A}; V_{GS} = 0$

$-V_{(BR)DSS}$  min. 60 V

Drain-source leakage current

$-V_{DS} = 48\text{ V}; V_{GS} = 0$

$-I_{DSS}$  max. 1.0  $\mu\text{A}$

Gate-source leakage current

$\pm V_{GS} = 20\text{ V}; V_{DS} = 0$

$\pm I_{GSS}$  max. 100 nA

Gate threshold voltage

$-I_D = 1\text{ mA}; V_{DS} = V_{GS}$

$-V_{GS(th)}$  min. 1.5 V  
max. 3.5 V

Drain-source ON-resistance

$-I_D = 200\text{ mA}; -V_{GS} = 10\text{ V}$

$R_{DS(on)}$  typ. 7.5  $\Omega$   
max. 10  $\Omega$

Transfer admittance

$-I_D = 200\text{ mA}; -V_{DS} = 15\text{ V}$

$|Y_{fs}|$  min. 60 mS  
typ. 125 mS

Input capacitance at  $f = 1\text{ MHz}$ ;

$-V_{DS} = 10\text{ V}; V_{GS} = 0$

$C_{iss}$  typ. 30 pF  
max. 45 pF

Output capacitance at  $f = 1\text{ MHz}$ ;

$-V_{DS} = 10\text{ V}; V_{GS} = 0$

$C_{oss}$  typ. 20 pF  
max. 30 pF

Feedback capacitance at  $f = 1\text{ MHz}$ ;

$-V_{DS} = 10\text{ V}; V_{GS} = 0$

$C_{rss}$  typ. 5 pF  
max. 10 pF

Switching times (see Figs 2 and 3)

$-I_D = 200\text{ mA}; -V_{DD} = 50\text{ V};$

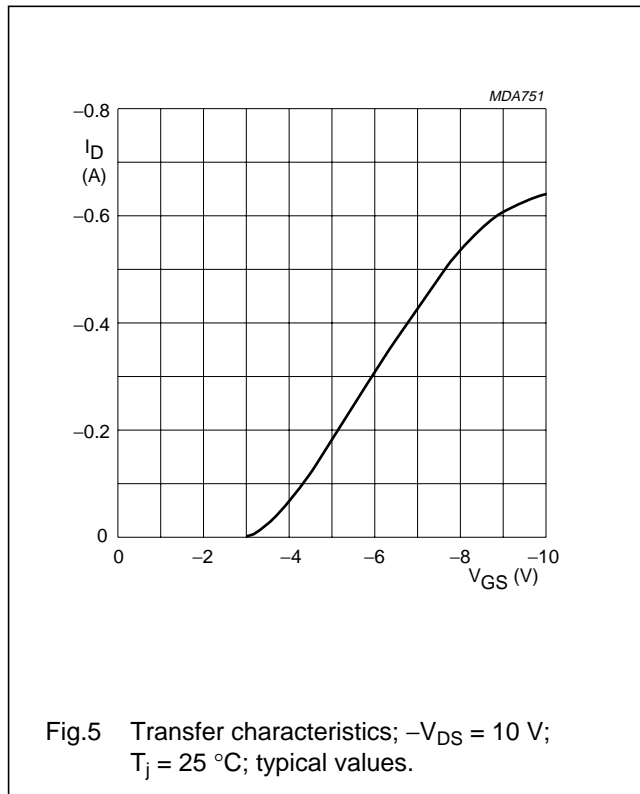
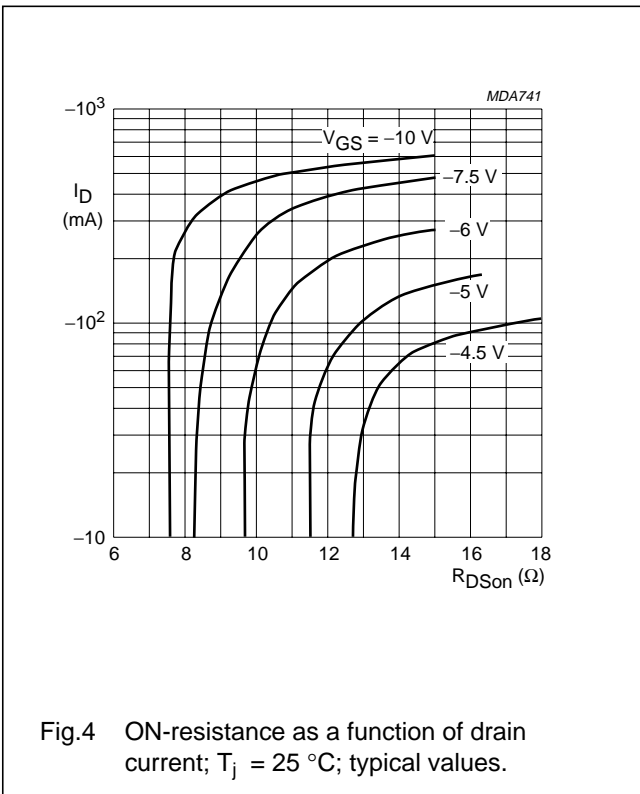
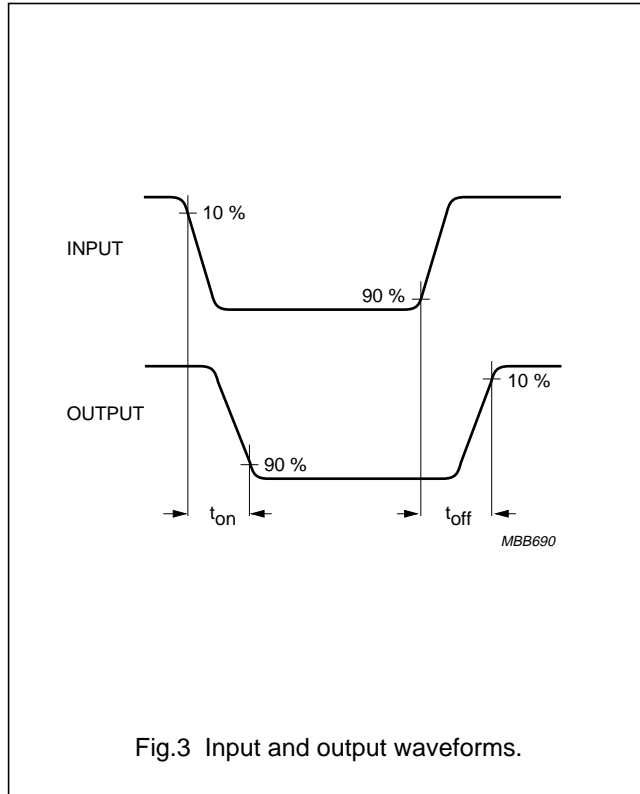
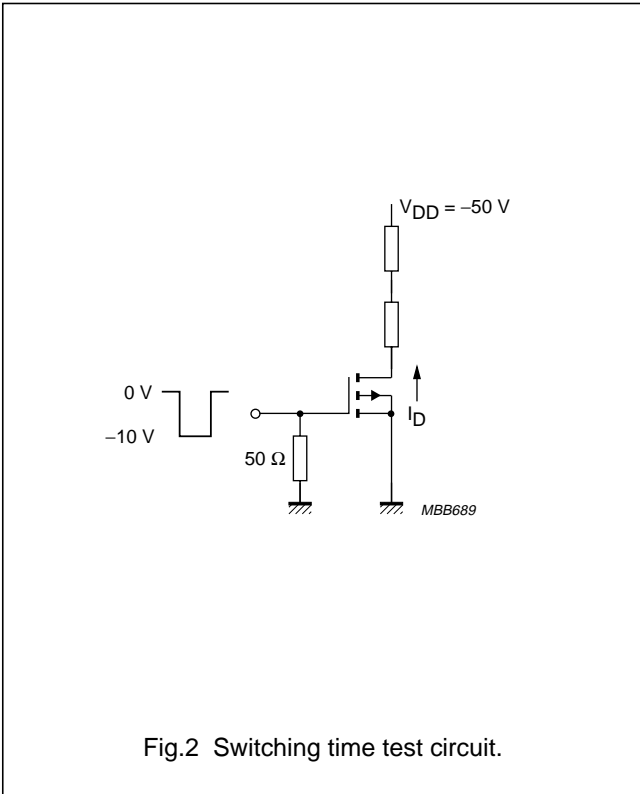
$-V_{GS} = 0\text{ to }10\text{ V}$

$t_{on}$  typ. 3 ns  
max. 6 ns

$t_{off}$  typ. 10 ns  
max. 15 ns

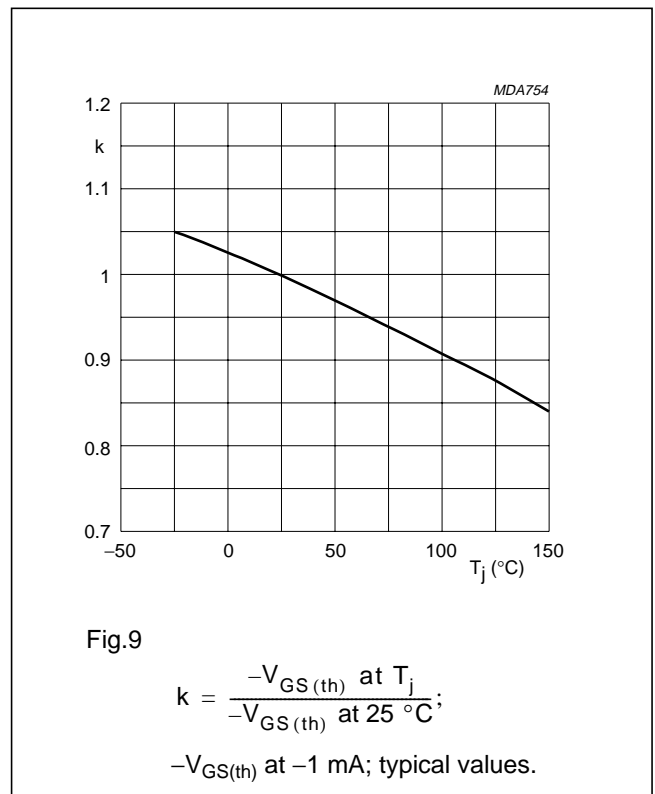
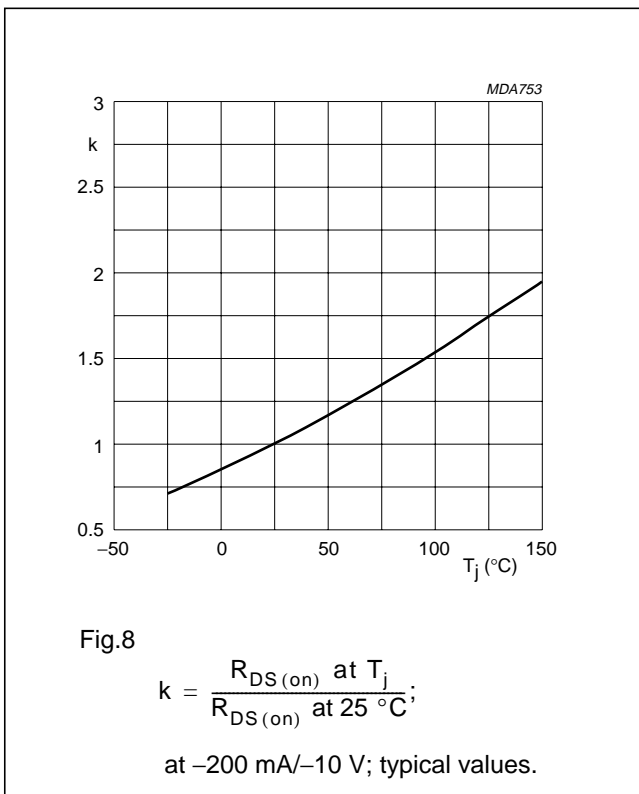
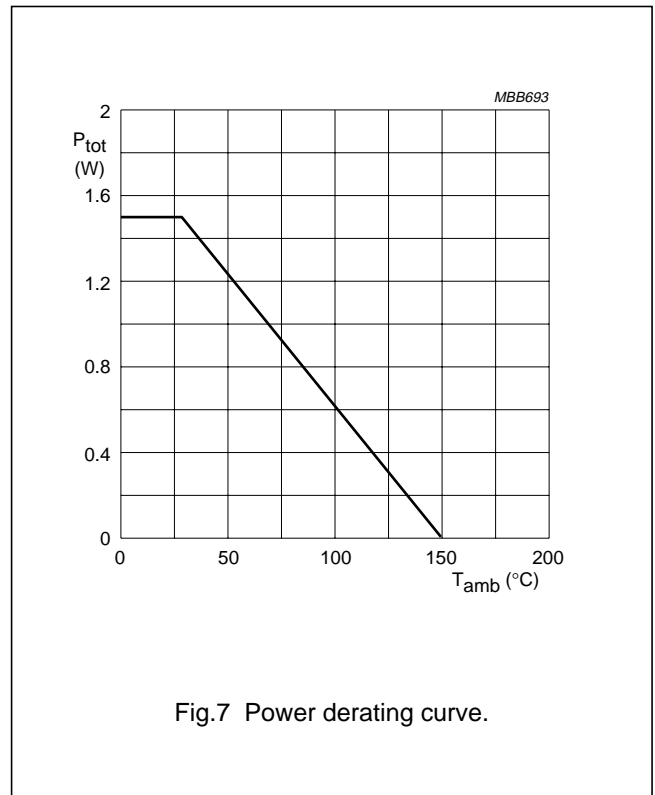
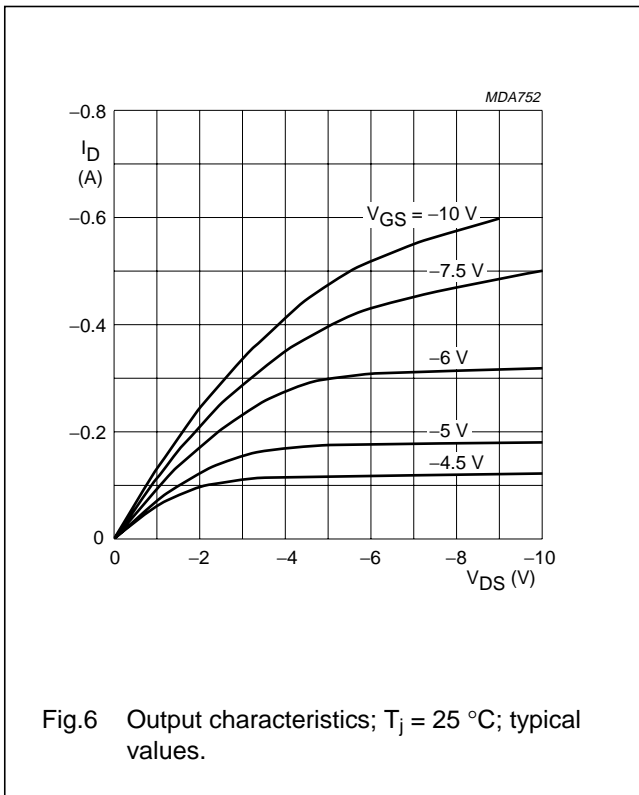
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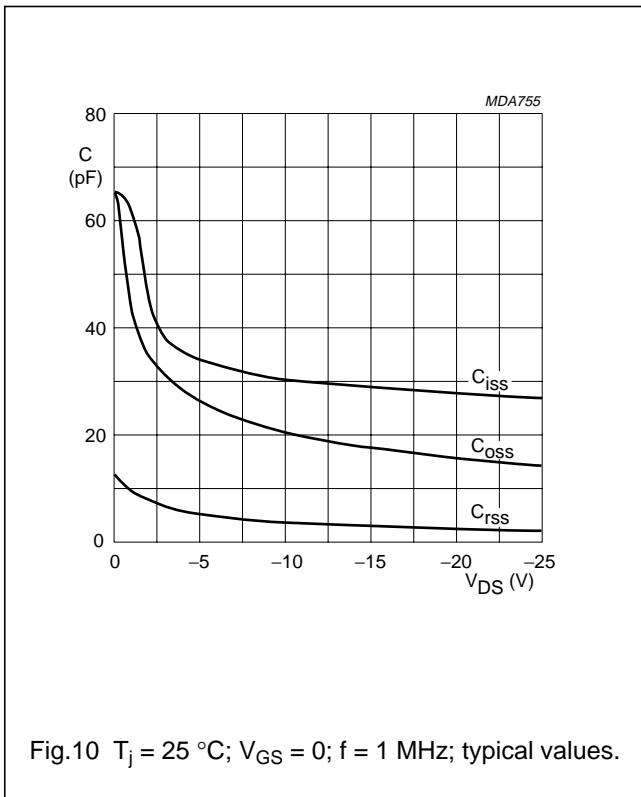
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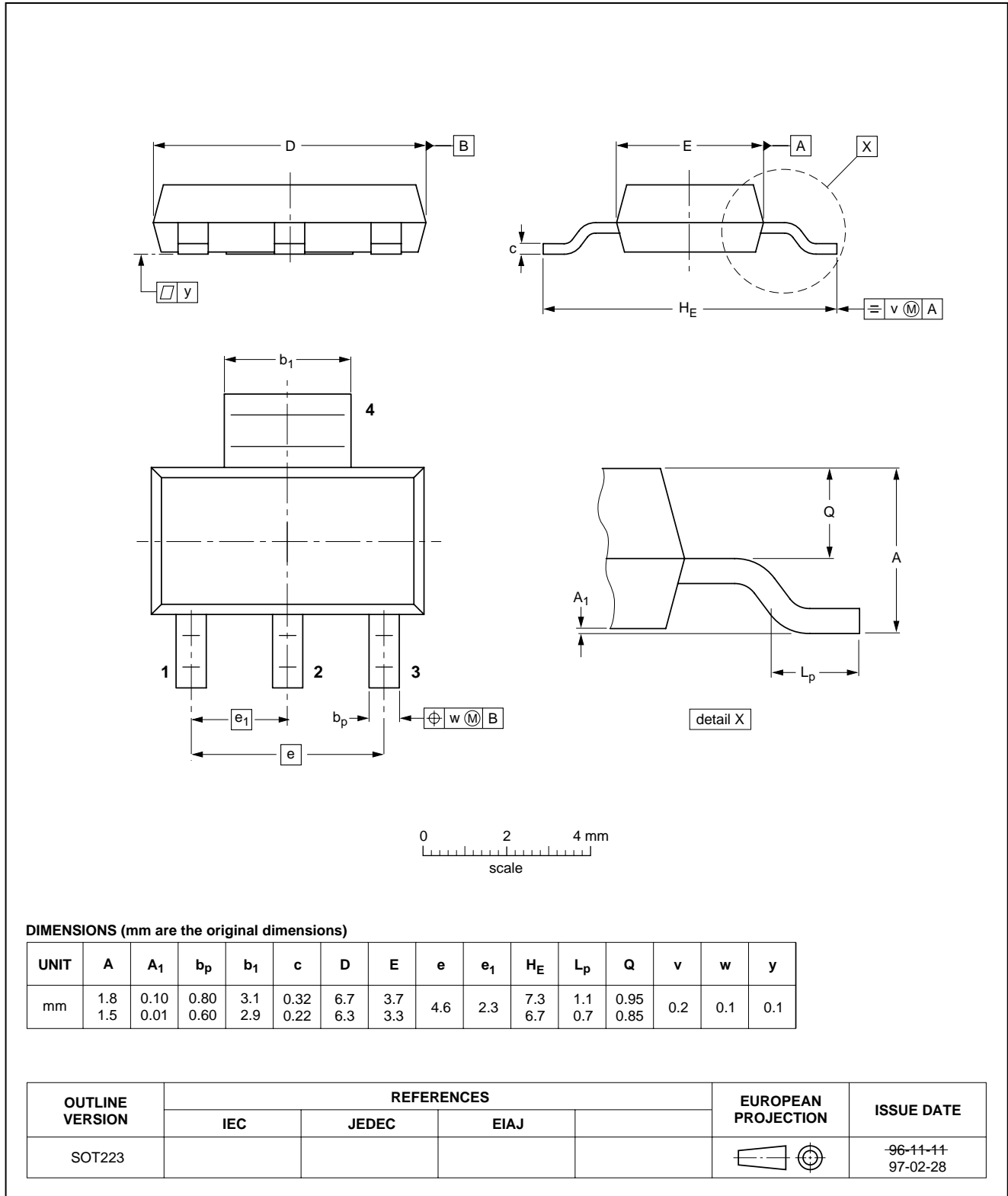
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PACKAGE OUTLINE

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

SOT223





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**BSP205****DEFINITIONS**

| <b>Data sheet status</b>  |   |
|---|---|
| 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.                                |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification. |   |

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**NOTES**

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**NOTES**

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