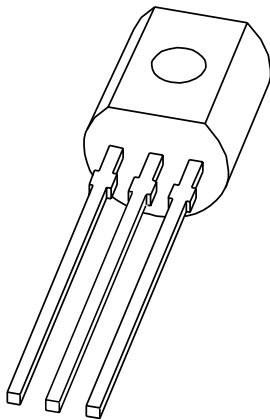


DATA SHEET



BSN254; BSN254A N-channel enhancement mode vertical D-MOS transistor

Product specification
Supersedes data of 1997 Jun 23

2002 Feb 19

N-channel enhancement mode vertical D-MOS transistor

BSN254; BSN254A

FEATURES

- Direct interface to C-MOS, TTL, etc.
- High-speed switching
- No secondary breakdown
- Low R_{DSon} .

APPLICATIONS

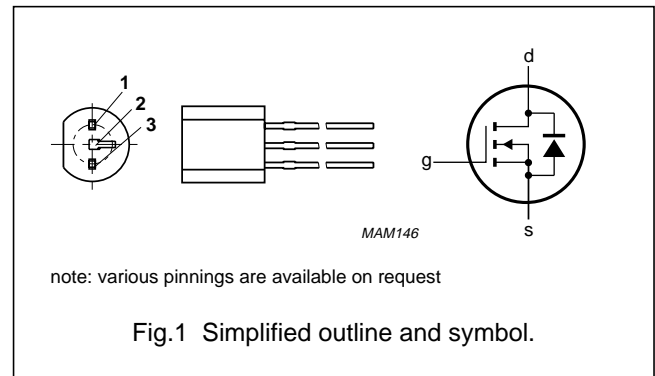
- Line current interruptor in telephone sets
- Relay, high-speed and line transformer drivers.

DESCRIPTION

N-channel enhancement mode vertical D-MOS transistor in a SOT54 (TO-92) variant package.

PINNING - SOT54 variant

| PIN | DESCRIPTION | |
|-----|-------------|---------|
| | BSN254 | BSN254A |
| 1 | gate | source |
| 2 | drain | gate |
| 3 | source | drain |



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|------------|----------------------------------|---|------|------|----------|
| V_{DS} | drain-source voltage (DC) | | – | 250 | V |
| I_D | drain current (DC) | | – | 310 | mA |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | – | 1 | W |
| R_{DSon} | drain-source on-state resistance | $I_D = 300\text{ mA}; V_{GS} = 10\text{ V}$ | 2.8 | 5 | Ω |
| V_{GSth} | gate-source threshold voltage | $I_D = 1\text{ mA}; V_{DS} = V_{GS}$ | – | 2 | V |

LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---------------------------|--|------|----------|--------------------|
| V_{DS} | drain-source voltage (DC) | | – | 250 | V |
| V_{GSO} | gate-source voltage (DC) | open drain | – | ± 20 | V |
| I_D | drain current (DC) | | – | 310 | mA |
| I_{DM} | peak drain current | | – | 1.25 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}; \text{note 1}$ | – | 1 | W |
| T_{stg} | storage temperature | | –55 | +150 | $^{\circ}\text{C}$ |
| T_j | junction temperature | | – | 150 | $^{\circ}\text{C}$ |

Note

1. Device mounted on a printed-circuit board; maximum lead length 4 mm; mounting pad for drain lead minimum $10 \times 10\text{ mm}$.

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THERMAL CHARACTERISTICS

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

Note

1. Device mounted on a printed-circuit board; maximum lead length 4 mm; mounting pad for drain lead minimum 10×10 mm.

CHARACTERISTICS

$T_j = 25$ °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---|----------------------------------|--|------|------|-----------|---------------|
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $I_D = 10\ \mu\text{A}; V_{GS} = 0$ | 250 | – | – | V |
| I_{GSS} | gate-source leakage current | $V_{GS} = \pm 20\ \text{V}; V_{DS} = 0$ | – | – | ± 100 | nA |
| V_{GSth} | gate-source threshold voltage | $I_D = 1\ \text{mA}; V_{DS} = V_{GS}$ | 0.8 | – | 2 | V |
| R_{DSon} | drain-source on-state resistance | $I_D = 20\ \text{mA}; V_{GS} = 2.4\ \text{V}$ | – | – | 7.5 | Ω |
| | | $I_D = 300\ \text{mA}; V_{GS} = 10\ \text{V}$ | – | 2.8 | 5 | Ω |
| I_{DSS} | drain-source leakage current | $V_{DS} = 200\ \text{V}; V_{GS} = 0$ | – | – | 1 | μA |
| $ Y_{fs} $ | transfer admittance | $I_D = 300\ \text{mA}; V_{DS} = 25\ \text{V}$ | 200 | 600 | – | mS |
| C_{iss} | input capacitance | $V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$ | – | 100 | 120 | pF |
| C_{oss} | output capacitance | $V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$ | – | 21 | 30 | pF |
| C_{rss} | feedback capacitance | $V_{DS} = 25\ \text{V}; V_{GS} = 0; f = 1\ \text{MHz}$ | – | 10 | 15 | pF |
| Switching times (see Figs 2 and 3) | | | | | | |
| t_{on} | turn-on time | $I_D = 250\ \text{mA}; V_{DD} = 50\ \text{V}; V_{GS} = 0\ \text{to}\ 10\ \text{V}$ | – | 6 | 10 | ns |
| t_{off} | turn-off time | $I_D = 250\ \text{mA}; V_{DD} = 50\ \text{V}; V_{GS} = 10\ \text{to}\ 0\ \text{V}$ | – | 47 | 60 | ns |

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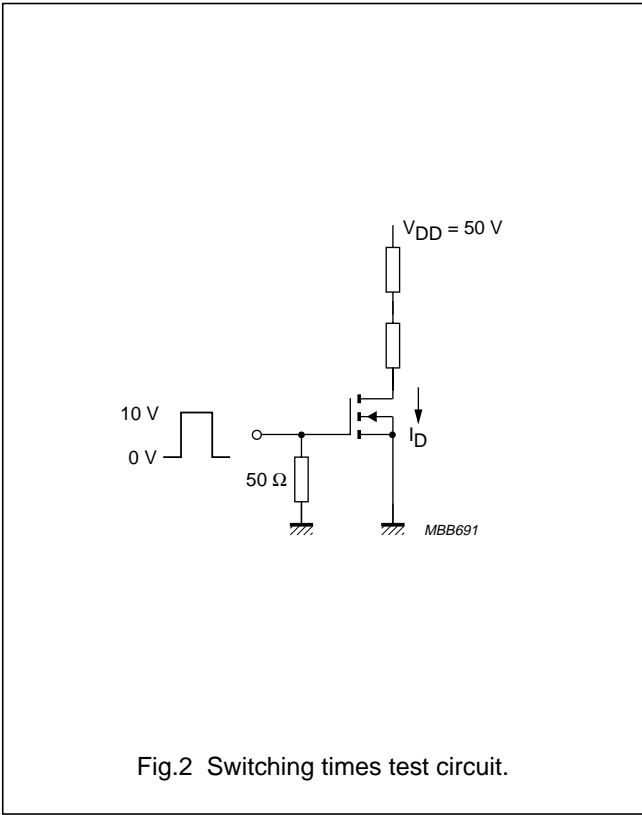


Fig.2 Switching times test circuit.

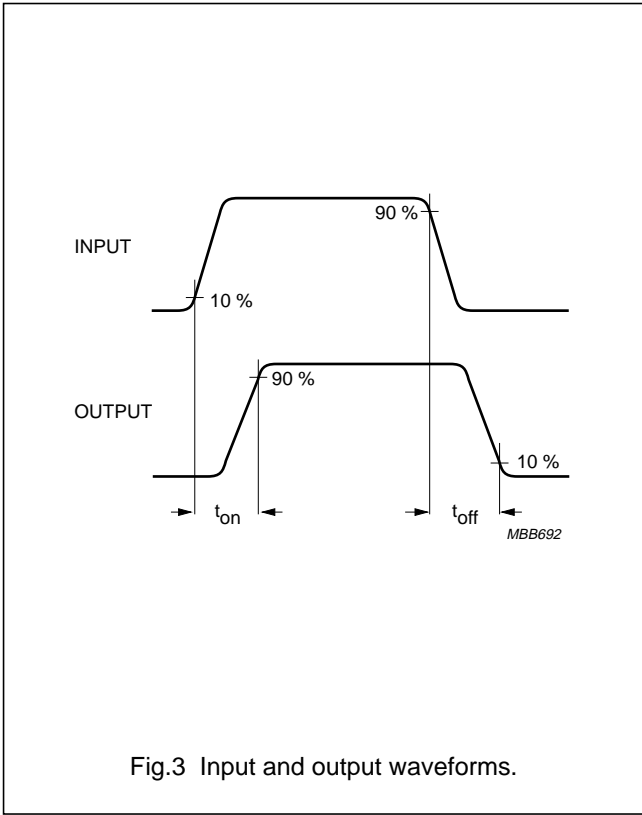


Fig.3 Input and output waveforms.

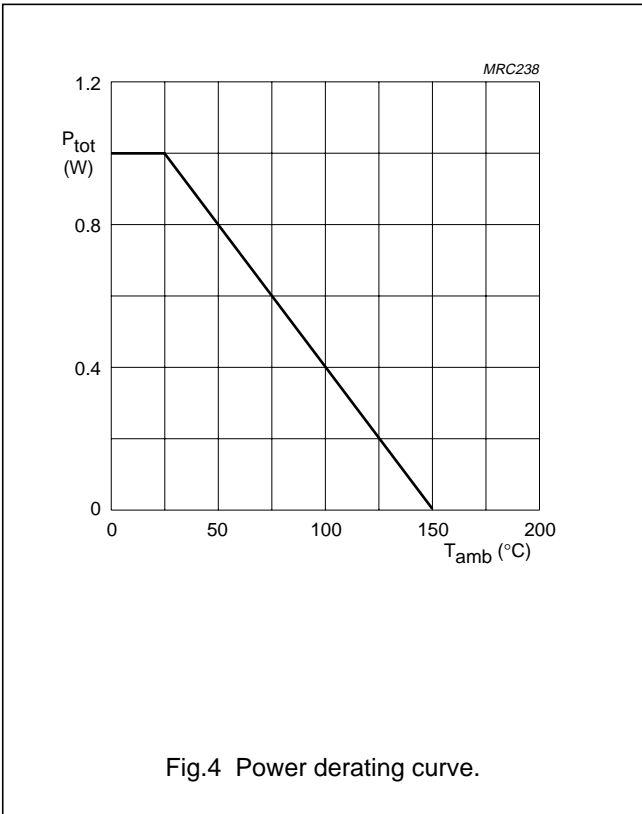
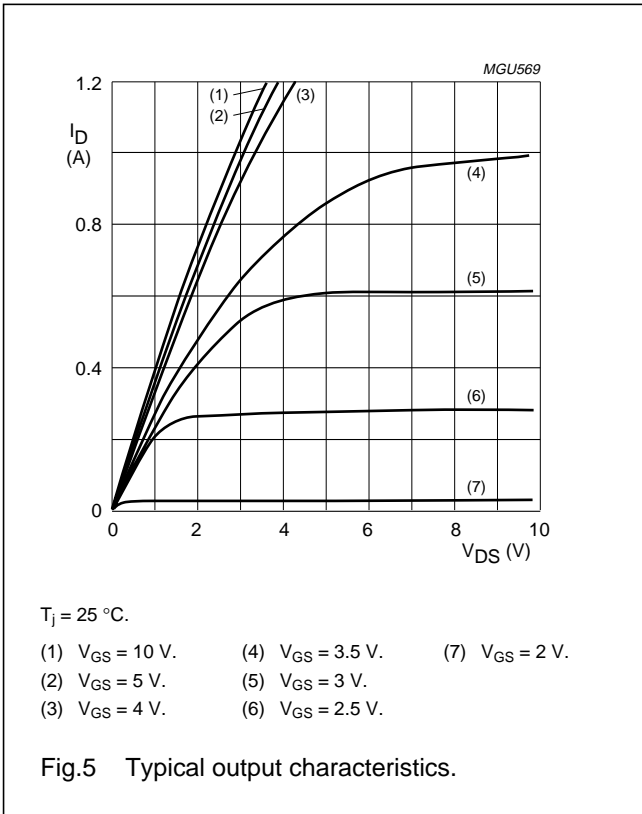


Fig.4 Power derating curve.



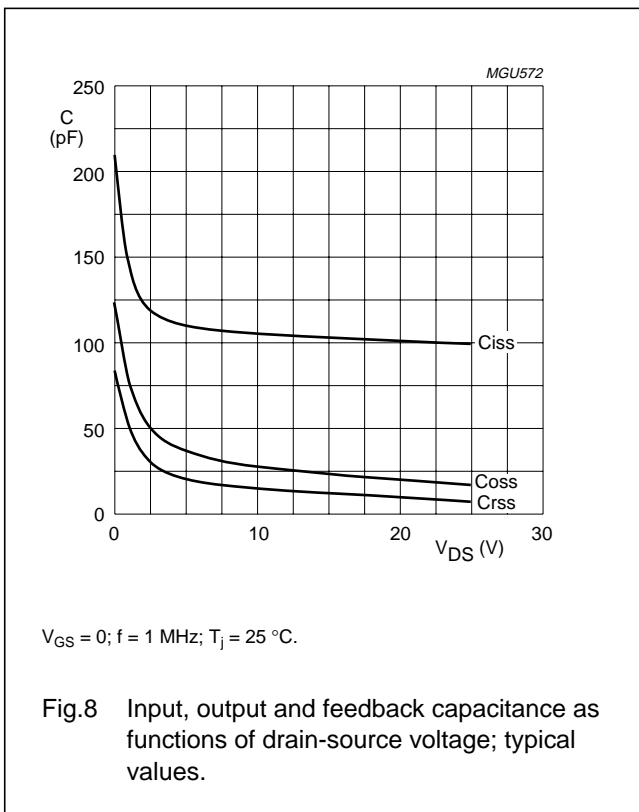
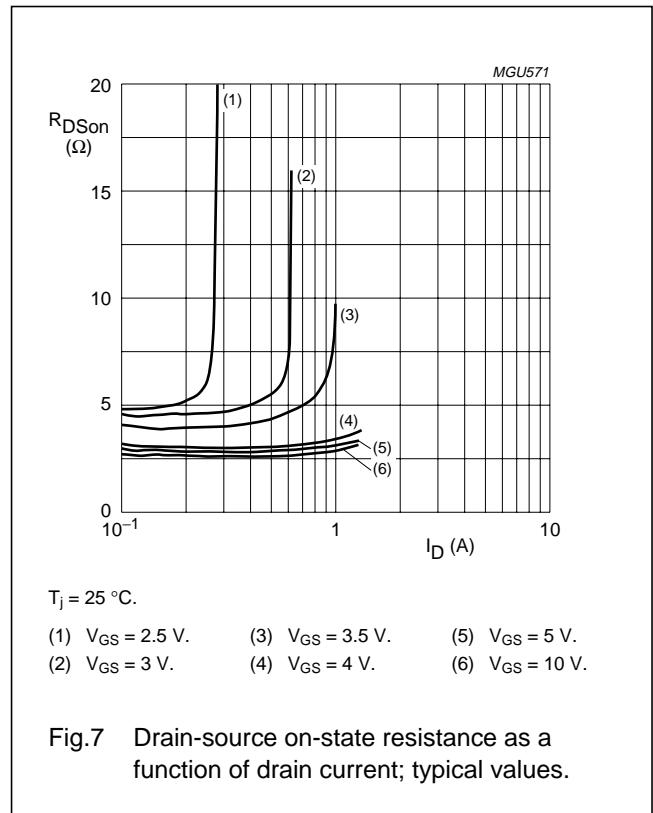
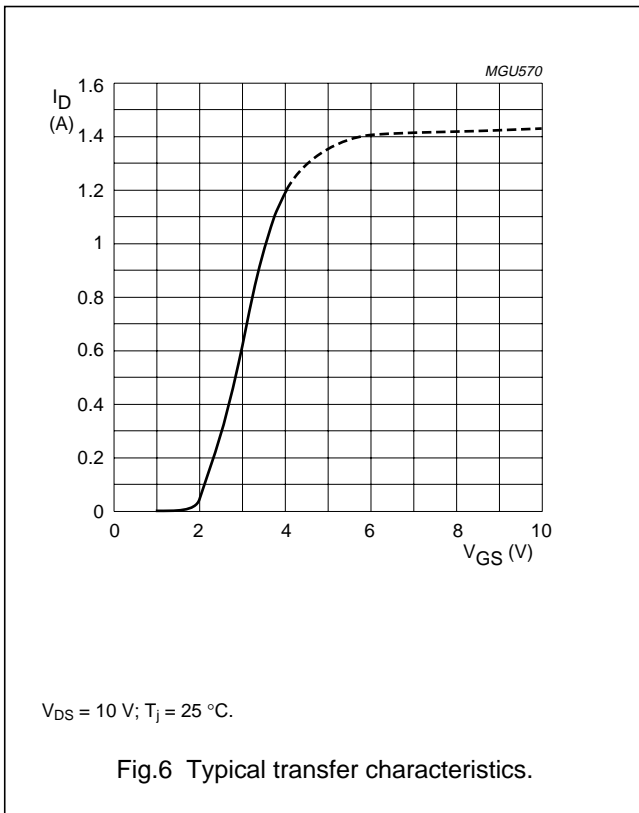
Tj = 25 °C.

- (1) VGS = 10 V. (4) VGS = 3.5 V. (7) VGS = 2 V.
- (2) VGS = 5 V. (5) VGS = 3 V.
- (3) VGS = 4 V. (6) VGS = 2.5 V.

Fig.5 Typical output characteristics.

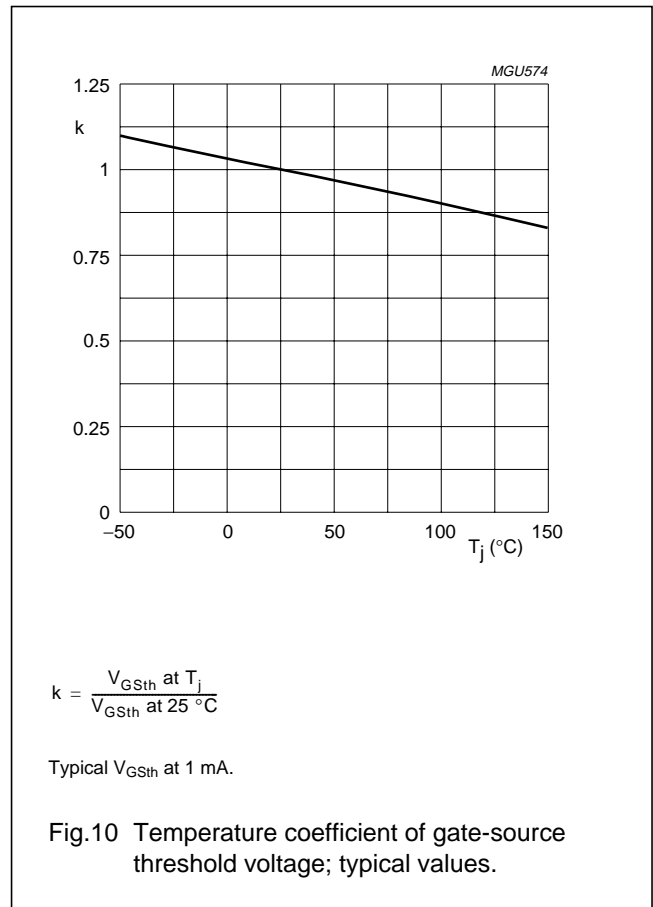
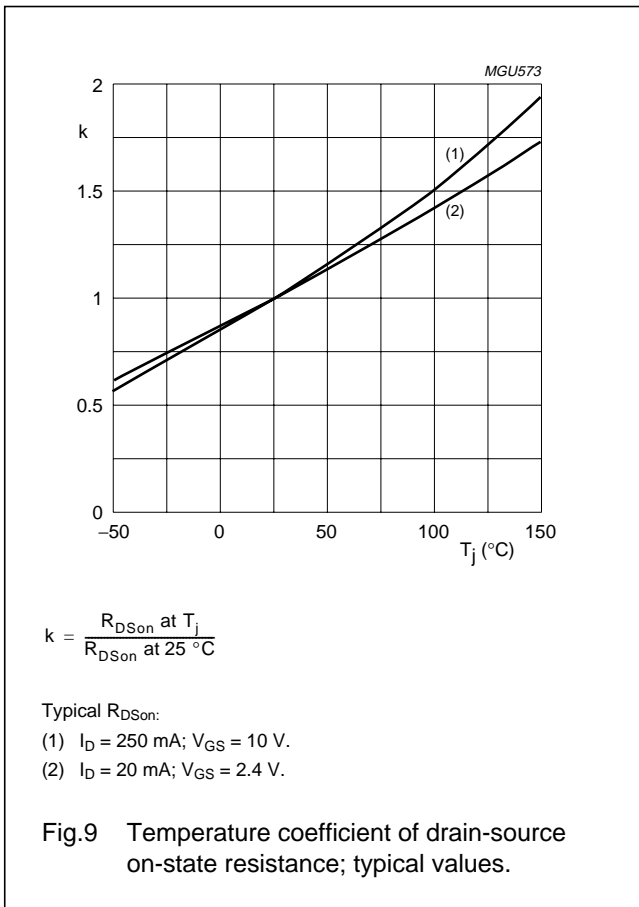
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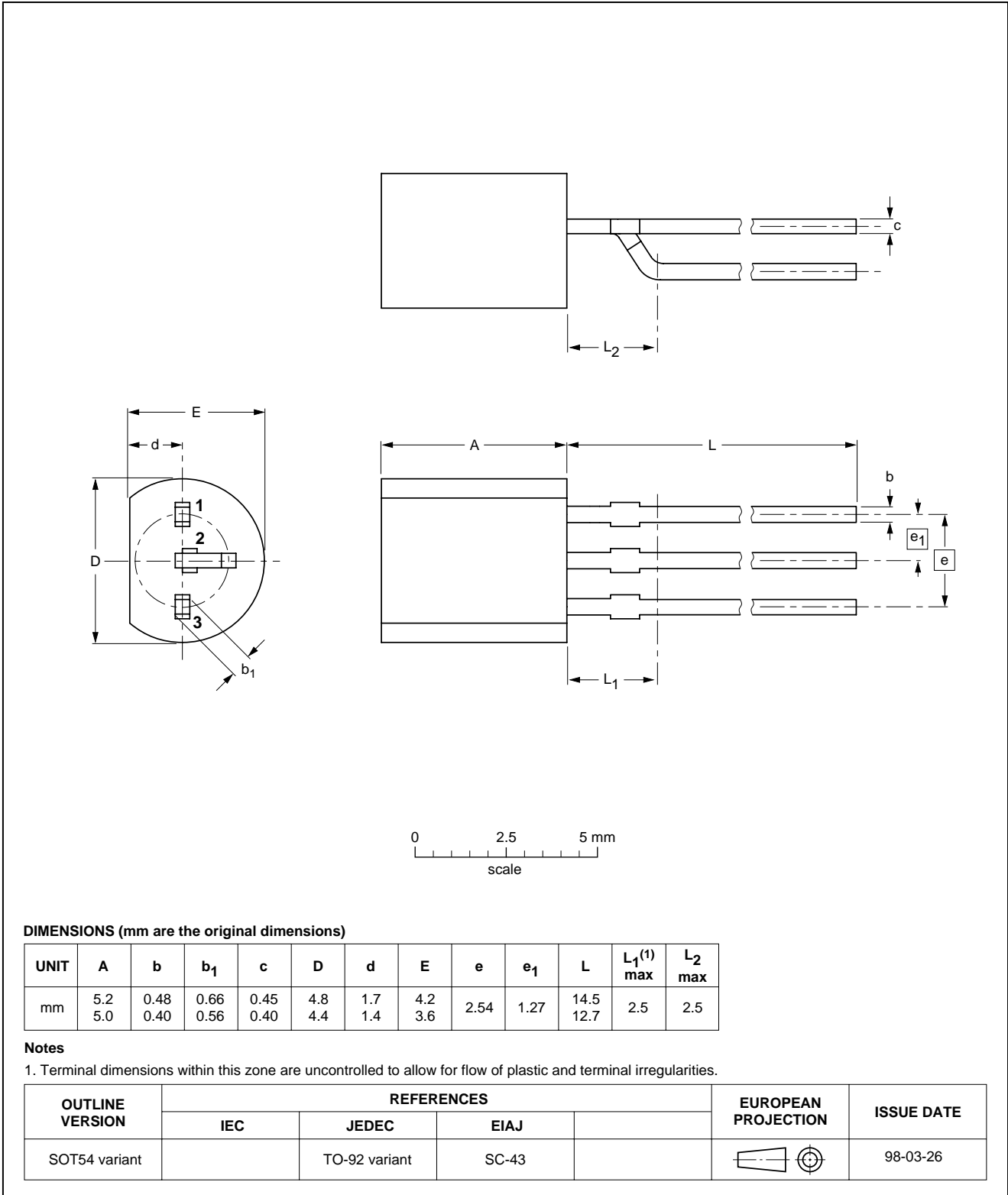
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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads (on-circle)

SOT54 variant



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DATA SHEET STATUS

| DATA SHEET STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITIONS |
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NOTES

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NOTES

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