

## Important notice

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Kind regards,

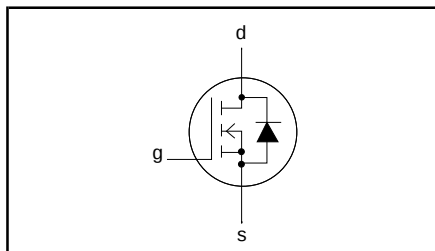
Team Nexperia

# N-channel TrenchMOS™ transistor

## Logic level FET

**BSS123****FEATURES**

- 'Trench' technology
- Extremely fast switching
- Logic level compatible
- Subminiature surface mounting package

**SYMBOL****QUICK REFERENCE DATA**

$$V_{DSS} = 100 \text{ V}$$

$$I_D = 150 \text{ mA}$$

$$R_{DS(ON)} \leq 6 \Omega (V_{GS} = 10 \text{ V})$$

**GENERAL DESCRIPTION**

N-channel enhancement mode field-effect transistor in a plastic envelope using 'trench' technology.

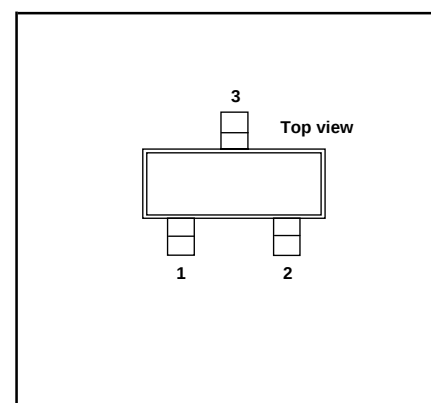
**Applications:-**

- Relay driver
- High-speed line driver
- Telephone ringer

The BSS123 is supplied in the SOT23 subminiature surface mounting package.

**PINNING**

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

**SOT23****LIMITING VALUES**

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

| SYMBOL         | PARAMETER                                  | CONDITIONS                                                                      | MIN. | MAX.     | UNIT             |
|----------------|--------------------------------------------|---------------------------------------------------------------------------------|------|----------|------------------|
| $V_{DSS}$      | Drain-source voltage                       | $T_j = 25^\circ\text{C}$ to $150^\circ\text{C}$                                 | -    | 100      | V                |
| $V_{DGR}$      | Drain-gate voltage                         | $T_j = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 20 \text{ k}\Omega$ | -    | 100      | V                |
| $V_{GS}$       | Gate-source voltage                        |                                                                                 | -    | $\pm 20$ | V                |
| $I_D$          | Continuous drain current                   | $T_a = 25^\circ\text{C}$                                                        | -    | 150      | mA               |
| $I_{DM}$       | Pulsed drain current                       | $T_a = 25^\circ\text{C}$                                                        | -    | 600      | mA               |
| $P_D$          | Total power dissipation                    | $T_a = 25^\circ\text{C}$                                                        | -    | 0.25     | W                |
| $T_j, T_{stg}$ | Operating junction and storage temperature |                                                                                 | - 55 | 150      | $^\circ\text{C}$ |

**THERMAL RESISTANCES**

| SYMBOL        | PARAMETER                              | CONDITIONS                   | TYP. | MAX. | UNIT |
|---------------|----------------------------------------|------------------------------|------|------|------|
| $R_{th\ j-a}$ | Thermal resistance junction to ambient | surface mounted on FR4 board | 500  | -    | K/W  |

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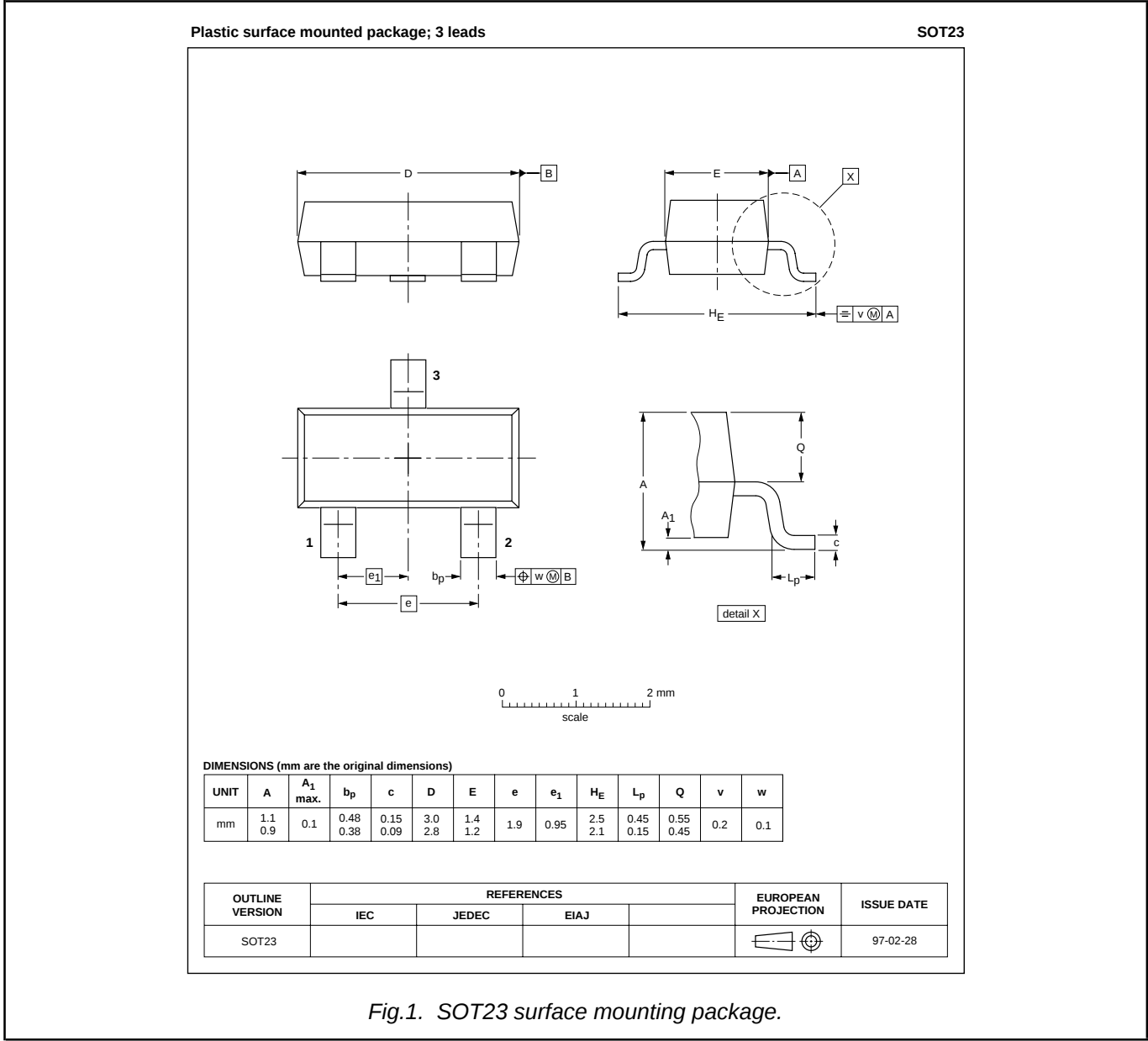
**BSS123****ELECTRICAL CHARACTERISTICS** $T_j = 25^\circ\text{C}$  unless otherwise specified

| SYMBOL        | PARAMETER                        | CONDITIONS                                                                                                                | MIN. | TYP. | MAX. | UNIT     |
|---------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------|------|------|------|----------|
| $V_{(BR)DSS}$ | Drain-source breakdown voltage   | $V_{GS} = 0\text{ V}; I_D = 10\text{ }\mu\text{A}$                                                                        | 100  | 130  | -    | V        |
| $V_{GS(TO)}$  | Gate threshold voltage           | $V_{DS} = V_{GS}; I_D = 1\text{ mA}$                                                                                      | 1    | 2    | 2.8  | V        |
| $R_{DS(ON)}$  | Drain-source on-state resistance | $V_{GS} = 10\text{ V}; I_D = 120\text{ mA}$                                                                               | -    | 3.5  | 6    | $\Omega$ |
| $g_{fs}$      | Forward transconductance         | $V_{DS} = 25\text{ V}; I_D = 120\text{ mA}$                                                                               | -    | 350  | -    | mS       |
| $I_{DSS}$     | Zero gate voltage drain current  | $V_{DS} = 60\text{ V}; V_{GS} = 0\text{ V}$                                                                               | -    | 10   | 100  | nA       |
| $I_{GSS}$     | Gate source leakage current      | $V_{GS} = \pm 20\text{ V}; V_{DS} = 0\text{ V}$                                                                           | -    | 10   | 100  | nA       |
| $t_{on}$      | Turn-on time                     | $V_{DD} = 50\text{ V}; R_D = 250\text{ }\Omega; V_{GS} = 10\text{ V};$<br>$R_G = 50\text{ }\Omega; \text{Resistive load}$ | -    | 3    | 10   | ns       |
| $t_{off}$     | Turn-off time                    |                                                                                                                           | -    | 12   | 20   | ns       |
| $C_{iss}$     | Input capacitance                | $V_{GS} = 0\text{ V}; V_{DS} = 25\text{ V}; f = 1\text{ MHz}$                                                             | -    | 23   | 40   | pF       |
| $C_{oss}$     | Output capacitance               |                                                                                                                           | -    | 6    | 25   | pF       |
| $C_{rss}$     | Feedback capacitance             |                                                                                                                           | -    | 4    | 10   | pF       |

N-channel TrenchMOS™ transistor  
Logic level FET

BSS123

MECHANICAL DATA



Notes

1. This product is supplied in anti-static packaging. The gate-source input must be protected against static discharge during transport or handling.
2. Refer to SMD Footprint Design and Soldering Guidelines, Data Handbook SC18.
3. Epoxy meets UL94 V0 at 1/8".

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**BSS123****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>Limiting values</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                       |
| Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). 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 this specification is not implied. Exposure to limiting values for extended periods may affect device reliability. |                                                                                       |
| <b>Application information</b>                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                       |
| Where application information is given, it is advisory and does not form part of the specification.                                                                                                                                                                                                                                                                                                                                                        |                                                                                       |
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